

# Bulletin of The Natural History Museum

## Entomology Series



VOLUME 64

NUMBER 1

29 JUNE 1995

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**The *Bulletin of The Natural History Museum* (formerly: *Bulletin of the British Museum (Natural History)*), instituted in 1949, is issued in four scientific series, Botany, Entomology, Geology (incorporating Mineralogy) and Zoology.**

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*World List* abbreviation: *Bull. nat. Hist. Mus. Lond.* (Ent.)

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ISSN 0968-0454

Entomology Series  
Vol. 64, No. 1, pp. 1-115

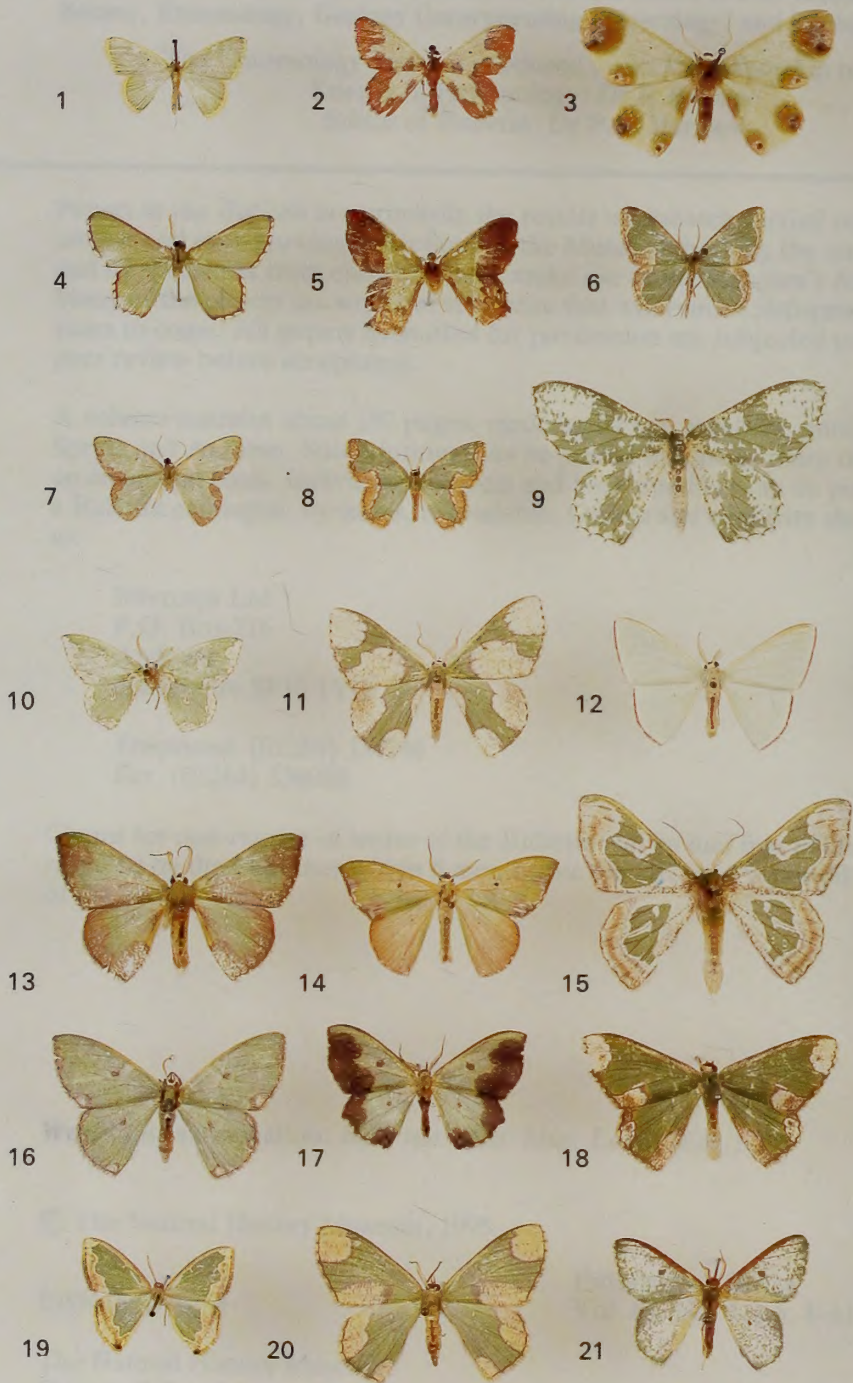
The Natural History Museum  
Cromwell Road  
London SW7 5BD

Issued 29 June 1995

Typeset by Ann Buchan (Typesetters), Middlesex  
Printed in Great Britain at The Alden Press, Oxford







**Plate 1** *Oospila* species, showing range of variation within the genus. 1, *O. flavilimes*; 2, *O. excrescens*; 3, *O. florepicta*; 4, *O. rhodophragma*; 5, *O. camilla*; 6, *O. astigma*; 7, *O. fimbripedata*; 8, *O. ecuadorata*; 9, *O. athena*; 10, *O. includaria*; 11, *O. albicoma*; 12, *O. ciliaria*; 13, *O. lilacina*; 14, *O. violacea*; 15, *O. obeliscata*; 16, *O. marginata*; 17, *O. atroviridis*; 18, *O. ruptimacula*; 19, *O. venezuelata*; 20, *O. depressa*; 21, *O. nivetacta*.



# Revision of the neotropical genus *Oospila* Warren (Lepidoptera: Geometridae)

MARK A. COOK and MALCOLM J. SCOBLE

Department of Entomology, The Natural History Museum, Cromwell Road,  
London SW7 5BD

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**SYNOPSIS.** The neotropical genera *Auophylla* Warren, *Auophyllodes* Prout, *Leptolopha* Warren, *Oospila* Warren, *Oospiloma* Prout, *Progonodes* Warren, *Racheolopha* Warren, *Rhombochlora* Warren and *Urucumia* Prout are united into a single genus and their species are taxonomically revised and described. All primary types available have been examined. The revised genus *Oospila* is a monophyletic group defined by the apomorphic character of the fusion of the juxta and transtilla to form what is here termed an anellar complex. Seventy-four species of *Oospila* are treated, of which one is described as new. Forty-eight species-group names are synonymized and 24 species are recombined with *Oospila*. The adult moths are illustrated and line drawings of the genitalia are provided for all species.

## INTRODUCTION

This study contributes to part of a larger research programme concerned with the systematics of neotropical Geometridae. The programme makes use not only of the extensive collections in the Natural History Museum, London, and selected material from other Museums, much of which dates back to the last century or to the early part of this century, but also of samples made within the last decade in Costa Rica and

housed in the National Institute of Biodiversity in San Jose. The samples from across the neotropics have been invaluable in providing a broad basis for the taxonomic study presented here; the more intense and recent collecting within Costa Rica is an invaluable resource for examining questions about the numbers of new species expected when such sampling is carried out. Besides improving the taxonomy of selected neotropical Geometridae, the data from this study, and other revisions, are enabling better estimates of species richness to be made.



The taxonomy of neotropical Emerald Moths (Geometridae: Geometrinae) has received no comprehensive attention since the studies of Prout (1912, 1932–38). Prout did not use genital morphology in his valuable studies, but relied on external characters alone. The variation in external characters without a corresponding study of genital morphology led to the creation of many synonyms. So, in order to understand better the species diversity of Geometrinae in the neotropics, and to provide a means of identifying these moths, revisionary work has proved essential. *Oospila*, as redefined in the present study, includes 74 species of Geometrinae. Pitkin (1993) dealt with a further 156 neotropical geometrine species belonging to three other genera. These two studies provide a detailed modern species-level treatment of a substantial proportion of the 450 described geometrine species estimated to occur in the neotropics.

### Taxonomic history of *Oospila*

The genus *Oospila* was erected by Warren (1897) for the type species (*Oospila trilunaria* (Guenée), formerly assigned to *Comibaena* Hübner, by Walker, 1861) and three species he described as new. Between 1897 and 1912, Warren described thirteen new species of *Oospila* (Warren 1900, 1901, 1904a, 1904b, 1905, 1906, 1907, 1909); one species, *Oospila albicoma* (Felder and Rogenhofer), was transferred from *Racheospila* Guenée, and another was described by Druce (1911).

The genus was revised by Prout (1912) who included 48 species (two of them new) or subspecies in the genus. Between then and the second revision of the genus by Prout (1932–33), ten further species were added by various authors. Prout's second revision included 58 species and 18 subspecies. Since 1932, the only work on the genus has been the description of two further species (Fletcher, 1951; Herbulot, 1991).

### Monophyly of *Oospila*

Prout (1932–33) noted the similarity in external appearance of *Oospila* and the neotropical genera *Auophylla* Warren, *Auophyllodes* Prout, *Oospiloma* Prout, *Progonodes* Warren and *Racheolopha* Warren. All six genera have strongly developed, dark brown, abdominal crests composed of scales raised above the level of the rest of the abdomen. Moreover, similar wing-pattern elements occur throughout these genera. The present study shows that the genitalia also exhibit many similarities: a reduced uncus, gnathi free, not fused medially, and the

presence of an anellar complex (see below) in the male, and very small anterior apophyses in the female. Prout (1932) suggested that these genera might reasonably be united into a single genus, but treated them as separate genera in his revision.

A cladistic analysis of exemplar taxa, chosen to cover the range of variation observed within this group of genera (Cook, 1993) produced three cladograms presenting equally valid options for classifying this group and for redefining *Oospila*. The analysis also demonstrated that all six genera form a monophyletic group defined by the presence of an anellar complex (which is considered, *a posteriori*, as secondarily reduced in those species from which it is absent). Since elements in the wing pattern and other characters occur throughout these genera, all these taxa are synonymized in the present study. Further investigation revealed the presence of an anellar complex in the neotropical genera *Leptolopha* Warren, *Rhombochlora* Warren and *Urucumia* Prout. These are also synonymized, below, with *Oospila*.

Although in the North American genus *Lophochorista* Warren the transtilla and juxta are not fused to form an anellar complex, this genus shares two important characters with *Oospila*: strong development of the abdominal crests and modification of the mesal region of the valva in the male genitalia. Both characters occur elsewhere in the Geometrinae and further analysis is required before deciding whether or not they are synapomorphic or independently derived. Preliminary analysis (Cook, 1993) suggests that *Lophochorista* and *Oospila* (in the revised sense accepted here) may be sister taxa.

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## MATERIAL AND METHODS

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All available primary types were examined.

Permanent slide mounts (in Euparal) of the male and female genitalia were prepared from specimens covering as wide a range of the distribution of each species as possible. After maceration of the abdomen in KOH and subsequent cleaning, male genital capsules were removed from the abdomen and mounted venter uppermost with the inner surfaces of the valvae displayed. The aedeagus was removed from the diaphragma and mounted on the same slide. The female genitalia were also removed from, and mounted alongside, the abdomen. Both male



and female genitalia are illustrated in ventral view.

Wing preparations were made for each species. Wings were treated in a dilute solution of household bleach and then stained lightly with mercurochrome. Permanent slide preparations were also made in Euparal.

Fore wing length is expressed as a range, measured along the costa from the wing base to its apex.

Locality, collection date, collector, number and sex of specimens and depository were recorded from specimen labels. These data are presented here and also stored electronically at the BMNH. Allocation of localities to provinces follows Brown (1979).

A key to species of *Oospila* is not included in this revision since it is not considered to be an effective means of identifying species of this large genus. A key to species groups is provided, but since most species of *Oospila* can be recognised from their wing markings alone, specimens are better identified initially by comparing them with the figures (Pl. 1; Figs 1–74). Confirmation may then be made by referring to the species descriptions and diagnoses.

## ABBREVIATIONS OF INSTITUTIONS

AMNH	American Museum of Natural History, New York, U.S.A.
BMNH	The Natural History Museum, London, U.K. (formerly British Museum (Natural History)).
CMNH	Carnegie Museum of Natural History, Pittsburgh, U.S.A.
CVCJ	Charles Van Orden Covell, Jr., collection, U.S.A.
HECO	Hope Entomological Collections, University Museum, Oxford, U.K.
HERB	Collection of Monsieur C. Herbulot, Paris, France.
INBio	Instituto Nacional de Biodiversidad, San Jose, Costa Rica.
MDHG	Museon Den Haag, Netherlands.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.
MNRJ	Museu Nacional, Rio de Janeiro, Brazil.
UCVM	Universidad Central de Venezuela, Maracay, Venezuela.
USNM	National Museum of Natural History, Washington D.C., U.S.A. (formerly United States

National Museum).

VOBB Vitor Osmar Becker collection, Planaltina, Brazil.

**ACKNOWLEDGEMENTS.** We are grateful to Dr V.O. Becker (VOBB), Dr J. Clavijo (UCVM); Dr D.C. Ferguson (USNM); Monsieur C. Herbulot (Paris); Professor D.H. Janzen (University of Pennsylvania, Philadelphia, U.S.A.) and his associates at the Instituto Nacional de Biodiversidad (INBio), San Jose, Costa Rica; Dr J. Minet (MNHN); Dr J.E. Rawlins (CMNH); Dr F.H. Rindge (AMNH), and Dr R. Shouten (MDHG) for providing material for this study. We thank Dr J.D. Holloway (CAB INTERNATIONAL); Dr G.C. McGavin (HECO) and Mrs L.M. Pitkin (BMNH) for their valued advice and comments during the course of this work. We are further grateful to Mrs Pitkin for her comments on a draft of the manuscript, for suggesting further synonymy, and for examining some types and other key specimens on our behalf in the USNM and INBio. The colour and black and white plates were taken by Mr H. Taylor (BMNH). We thank the Trustees of The Natural History Museum for facilities, and for the award of a postgraduate studentship to MAC.

## *OOSPILA* WARREN, 1897

*Oospila* Warren, 1897: 426. Type-species: *Phorodesma trilunaria* Guenée, 1857: 372, by original designation.

*Auophylla* Warren, 1897: 423. Type-species: *Thalera includaria* Herrich-Schäffer [1855] 1850–1858: pl. 61, fig. 341, by original designation. **Syn.n.**

*Progonodes* Warren, 1897: 429. Type-species: *Racheospila stagonata* Felder & Rogenhofer, 1875: pl. 127, fig. 25, by original designation. **Syn.n.**

*Drucia* Warren, 1900: 133. Type-species: *Drucia delphinata* Warren, 1900: 133, by original designation. Synonymized by Prout, 1912: 132.

*Racheolopha* Warren, 1900: 137. Type-species: *Racheospila miccularia* Guenée, 1857: 374, by original designation. **Syn.n.**

[*Anophylla* Warren, 1906: 414. Incorrect subsequent spelling of *Auophylla* Warren.]

*Halioscia* Warren, 1907: 202. Type-species: *Halioscia atroviridis* Warren, 1904a: 24, by subsequent designation by Fletcher, 1979: 95. Synonymized by Prout, 1912: 132.

*Leptolopha* Warren, 1909: 78. Type-species: *Lis-sochlora flavilimes* Warren, by original designation. **Syn.n.**

*Rhombochlora* Warren, 1909: 89. Type-species:



*Rhombochlora granulata* Warren, by original designation. **Syn.n.**

*Auophyllodes* Prout, 1912: 20 (key), 130. Type-species: *Comibaena venezuelata* Walker, 1861: 570, by original designation. **Syn.n.**

*Oospiloma* Prout, 1916: 170. Type-species: *Oospila thalassina* Warren, 1905: 318, by original designation. **Syn.n.**

*Urucumia* Prout, 1933: 71. Type-species: *Urucumia acymanta* Prout, 1933: 71, by original designation. **Syn.n.**

## General appearance (Pl. 1)

*Oospila* species are slender-bodied Geometrinae. Their wings are typically dark green and patterned with creamy blotches.

## Head

Vestiture of frons brown, occasionally green. Vestiture of vertex brown dorsally, cream ventrally, or sometimes entirely green. Interantennal fillet (i.e. vestiture between antennal bases) usually white, less commonly, brown. Chaetosemata small; external ocelli absent; compound eyes large, round. Antennae of both sexes bipectinate for basal 2/3, simple towards apex; simple along entire length in females of some species. Where present, rami usually approximately same length in both sexes. Labial palpi brown dorsally, cream ventrally; segment 3 usually short in male and longer in female. Maxillary palpi very short and 1-segmented; proboscis well developed, unscaled.

## Thorax

Vestiture of thorax and patagia concolorous with ground colour of wings; typically dark green, in some species pale green, dark brown, reddish-brown, cream or white.

Vestiture of fore leg brown on anterior surface, cream on lateral and posterior surfaces. Fore tibia bearing an epiphysis. Tibial spur formula 0-2-2 except for *thalassina* group (0-2-4). Hind tibia of some males with a recessed brush of long hair-like scales.

Wings never reduced in size; approximately triangular in most species. Hind wing of some species with short extension at distal end of vein  $M_3$ ; extension usually marked by tuft of long scales projecting beyond fringe (e.g. as in *asmura*, Fig. 17). Fore wing length (i.e. length of costa from base to apex): range 7-26 mm. Some species with wings slightly larger in female than in male. Frenulum a well developed spine in

male hind wing (absent from *acymanta*); absent from female. Ground colour of wings dark or pale green, but very pale blue-green in *ciliaria* (Pl. 1: 12), and yellow in *subaurea*.

**Fore wing:** costal edge usually pale brown, occasionally dark brown or white; discal spot typically small and brown, sometimes enlarged (e.g. as in *altonaria*, Fig. 46 and *obeliscata*, Pl. 1: 15 and Fig. 53). Markings white, cream, brown, reddish-brown or black (Pl. 1), often taking form of blotches situated at or near apex and tornus; blotches largely separate, but frequently connected by narrow band along termen, or represented by indistinct band along termen (e.g. as in *pellucida*, Fig. 68). Fore wing speckled in some species (e.g. *semispurcata*, Fig. 12), or with more complex pattern (e.g. as in *obeliscata*, Pl. 1: 15 and Fig. 53).

**Hind wing:** markings usually similar to fore wing; sometimes (e.g. *albicomma albicomma*, Pl. 1: 11, Fig. 39) with small, narrow blotch at anal margin in addition to blotches at apex and tornus; one or two discal spots generally present, usually small and brown or white, but may be modified as in fore wing.

**Venation** (Figs 75, 76): fairly constant throughout genus, with minor inter- and intra-specific variation. Fore wing: vein  $R_1$  diverges at apex of discal cell (Fig. 75), except in *astigma* group and *miccularia* group where it diverges distal to  $M_1$  (Fig. 76). Accessory cells absent. Vein  $R_2$  diverging proximal to  $R_5$ , except in *venezuelata*. Vein  $M_1$  diverging from  $R_s$  distal to discal cell. Cross-vein  $M_2-M_3$  often weaker (but not in those species illustrated, Figs 75, 76) than cross-vein  $M_1-M_2$  and sometimes discontinuous at its centre. Hind wing (Figs 75, 76): vein  $M_2$  arising nearer  $M_1$  than  $M_2$ ; cross-vein  $M_2-M_3$  either continuous with cross-vein  $M_1-M_2$  (e.g. *delacruzii*, Fig. 76) or displaced distally (e.g. *marginata*, Fig. 75). Vein 3A absent.

## Abdomen

Dorsal surface of abdomen bearing large, distinctive crests on terga A2-A5 (see, for example, Pl. 1); smaller, paler crests on terga A6 and A7 (reduced or absent in species with smaller abdomens). Crests dark brown with white centres, in most species, but cream, often with brown flecks, in *flavilimes* group. Crests of most species composed of broad scales with a central brush of longer, thinner, hair-like scales. Rest of dorsal surface typically cream (Pl. 1), in some species green, brown (Pl. 1) or patterned. Crests in some species surrounded by white area sometimes enclosed by a thin, pink line. Ventral and lateral



surfaces of abdomen cream-coloured.

Tympanal organs: ansa narrow just above base, widening to form broad flat plate then narrowing towards apex. Tympanic laciniae absent; lobe of tympanic bulla absent.

Pregenital abdomen of female lacking species-specific structures with all segments simple. Sternum A2 of male frequently modified and sternum A8 usually modified (Fig. 77); posterior edge of sternum A2 in males of some species slightly emarginated (Fig. 77) with small, elliptical sclerite occurring in intersegmental membrane of sterna A2 and A3. Where elliptical sclerite present, sternum A2 also bearing two brushes of long hair-scales meeting over sclerite. Sternum A8 of most species strongly sclerotized, often enlarged, and typically with posterior edge either emarginated or with a bifurcate extension.

**MALE GENITALIA** (Figs 78–145). Uncus usually short, sometimes reduced to narrow bar; long in *quinquemaculata* and *thalassina* groups (e.g. Fig. 84). Socii membranous, usually quite large, sometimes reduced. Gnathos usually prominent, consisting of two large, strongly sclerotized horn-like processes, broadest at base and tapering towards apex; gnathi lying across uncus, often meeting along midline (e.g. Fig. 78) (displaced in most illustrations to display uncus); gnathos a completely fused ring in *quinquemaculata* and *thalassina* groups (Figs 84–92); reduced in a few species (e.g. *pallidaria*, Fig. 81) or greatly enlarged (e.g. *decorata*, Fig. 79). Tegumen varying in breadth, sometimes strengthened by an X-shaped sclerotized brace (e.g. *excrescens*, Fig. 86). Valva with apex rounded or sculpted, sometimes divided by a cleft, sometimes with small spines at apex (e.g. *albipunctulata*, Fig. 100); costal edge of valva more strongly sclerotized in some members of *quinquemaculata* group (e.g. in *quinquemaculata*, Fig. 84), occasionally modified (e.g. in *continuata*, Fig. 85); ampulla (a process of mesal area of valva; Fig. 78, and see Klots, 1970) often prominent; shape generally distinctive for species; sacculus usually developed and often extended into short, strongly sclerotized, and usually pointed, process (e.g. Figs 79, 80); saccular edge of valva usually emarginated when sacculus developed. Anellar complex (e.g. as in Fig. 78) conspicuous, typically surrounding aedeagus; attached to valvae by short extensions from its medial (e.g. *O. longiplaga*, Fig. 137) or posterior (e.g. *O. trilunaria*, Fig. 117) regions; sometimes anellar complex not attached to valva, but held in position by membranous part of diaphragma (e.g. *O. albicoma albicoma*, Fig. 113); anellar complex sometimes

secondarily reduced (e.g. in *florepecta*, Fig. 87), often to V-shaped sclerite, which is fused with the valva posteriorly. Coremata usually absent, but present in *quinquemaculata* group and arising from base of each valva (e.g. Fig. 84). Aedeagus usually long, narrow and cylindrical; small cornutus occurring on vesica of many species (e.g. in *nigripunctata*, Fig. 80); additional cornuti, or other modifications, occasionally present (e.g. *astigma*, Fig. 97).

**FEMALE GENITALIA** (Figs 146–199). Anterior apophyses reduced to exceptionally short projections (e.g. Fig. 146). Sterigma usually strongly sclerotized and variously modified; presence and shape often diagnostic at species level. Bursa copulatrix (e.g. Fig. 146): ductus bursae typically consisting of long, relatively narrow duct, leading into enlarged, membranous, corpus bursae; antrum sometimes funnel-shaped (Fig. 153); ductus usually long and strongly sclerotized anterior to antrum, and bearing longitudinal striations (e.g. *decoloraria*, Fig. 189); corpus bursae a membranous sac, either approximately spherical or bulbous and varying in size between species; denticles on internal surface of corpus visible at 200× magnification; signum usually present, small, in form of a narrow sclerotized band with tooth at each end protruding into corpus (e.g. as in Fig. 146) (teeth often not visible when corpus viewed laterally).

### Comments on morphology

1. As with all Geometrinae, the wing colours of *Oospila* are prone to fading (e.g. Cook *et al.*, 1993). Old specimens are usually paler green than fresh material and, in some cases (particularly in specimens of *violacea*, Pl. 1: 14), may fade to pale yellow. The potential for colour change should be remembered when identifying material not recently collected.
2. It seems likely that the elliptical sclerite situated in the intersegmental membrane of abdominal segments A2 and A3 is associated with dissemination of pheromones in some way. This sclerite does not seem to occur in other Geometrinae and it may represent an apomorphy of *Oospila*. Its distribution within the genus is not consistent with species groups suggested by other characters.
3. The shape of sternum A8 in the male is a valuable character for identifying species of *Oospila*; it is diagnostic in certain species where other external features are indistinguishable (e.g. in *marginata*, *obsolescens* and *tricamerata*). The structure can usually be



- inspected without dissecting the specimen.
4. The ampulla of the valva also occurs in *Lophochorista lesteraria* Grossbeck. *L. lesteraria* is probably the sister species of the genus *Oospila* (Cook, 1993). In addition to the ampulla, additional processes arise from, or close to, the costa of the valva in some species (e.g. in *venezuelata*, Fig. 141).
  5. The term 'anellar complex' (e.g. see Fig. 78) is used to describe the conspicuous, diagnostic sclerotization of the diaphragma surrounding the aedeagus. This complex has probably arisen from the fusion of the transtilla and the juxta, structures occurring frequently in Geometrinae, but appearing to have become fused only in *Oospila*. Typically, the anellar complex surrounds the aedeagus. Functionally, the anellar complex appears to serve as a support for the aedeagus. The anellar complex may be attached to the valvae by short extensions from its medial (e.g. *O. longiplaga*, Fig. 137) or posterior (e.g. *O. trilunaria*, Fig. 117) regions. These extensions are probably homologous with the transtillae of some other Geometrinae. In some species (e.g. *O. albicoma albicoma*, Fig. 113) the anellar complex is not attached to the valvae, but is held in position by a membranous part of the diaphragma. In certain species the anellar complex is secondarily reduced (e.g. in *florepecta*, Fig. 87), often to a V-shaped sclerite, which is fused with the valvae posteriorly.

## Immature stages

The only species for which larval data have been recorded (D.H. Janzen, personal communication) is *O. confundaria* Möschler, in dry forest at 300 m elevation in the Guanacaste Conservation Area of northwestern Costa Rica. The larva is light green with a slight rosy or brownish cast in a few individuals. It eats the expanding leaves of *Hymenaea courbaril* (Leguminosae) and is moderately common in the crowns of saplings 1–3 m tall when they are forming new leaves (a phenomenon occurring throughout the year). Mature trees of this species produce leaves only in December and January, but it is not known whether larvae are found in mature trees at this time of the year. Janzen (pers. comm.) has found mature larvae in March, May, June, August and December. When not feeding, the caterpillar holds itself motionless and straight, at an angle so as to look similar to a young *Hymenaea* twig or petiole (Janzen, 1988). The naked pupae are

deposited in litter (Janzen, personal communication).

## Distribution

The genus occurs widely in tropical America and has been recorded from Mexico, Cuba, Jamaica, Guatemala, Belize, Nicaragua, Costa Rica, Panama, French Guiana, Surinam, Guyana, Trinidad, Venezuela, Colombia, Ecuador, Peru, Bolivia, Argentina, Paraguay, and Brazil. *Oospila venezuelata* has been recorded from Mexico, which seems to be the most northerly limit to the distribution of this genus, and only *O. includaria* has been recorded from Argentina, which seems to represent the southern limit of the genus.

## Diagnosis

*Oospila* can be distinguished from other Geometrinae by the composition of the abdominal scale-crests. In the few other Geometrinae that have them, these crests are formed entirely of long hair-like scales whereas in *Oospila* they are composed of much broader scales surrounding a central brush of long, thin, hair-like scales. The presence of the anellar complex in the male genitalia is also diagnostic, except in those few species where it has been reduced secondarily. A few other Geometrinae have blotches on their wings (e.g. *Cheroscelis oospila* Prout); but, with the exception of *Chavarriella* Pitkin, these species do not occur in the neotropics. The male genitalia of *Chavarriella* are very different from those of *Oospila*, and *Chavarriella* lacks the abdominal crests found in *Oospila*.

## Habitat and biology

*Oospila* is restricted to tropical areas of Central and South America. Species have been collected in transitional cloud forest (e.g. at Rancho Grande in the Henri Pittier National Park, Venezuela) and lowland dry forest (e.g. at Santa Rosa National Park, northwestern Costa Rica). However, most specimens examined were collected in lowland rain forest areas of continental South America. In the rain forest, adults of most species for which data are available have been collected in both wet and dry seasons.

## Remark

The original descriptions of *Auophylla* and *Oospila* were published in the same work (Warren, 1897). Although *Auophylla* was described



three pages prior to *Oospila*, adopting *Auophylla* as the senior synonym would have resulted in 32 more new combinations. To avoid this complication, *Oospila* is selected (above) as the senior synonym, a decision in accord with the International Code of Zoological Nomenclature (1985) (Article 24a).

Key to species groups of *Oospila*

- 1 Abdominal crests poorly developed and blotches absent from wings; wings often with pale yellow band along termen (7 species, Figs 1–7) ..... *flavilimes* group
- Crests well developed or blotches present on wings; wings without pale yellow band along termen ... 2
- 2 Two pairs of spurs on male hind tibia (2 species, Figs 8–9) ..... *thalassina* group
- Single pair of spurs on male hind tibia ..... 3
- 3 R<sub>1</sub> of fore wing arising distad of the origin of M<sub>1</sub> (Fig. 76) ..... 4
- R<sub>1</sub> of fore wing arising basad of the origin of M<sub>1</sub> (Fig. 75) ..... 5
- 4 Field of large spines present towards the apex of the dorsal surface of the male valva (3 species, Figs 105–107) ..... *miccularia* group
- Field of spines absent, or spines small (as in *zamaradaria*, Fig. 104)(8 species, Figs 97–104) . *astigma* group
- 5 Hind wing with short extension at the distal end of M<sub>3</sub>, terminating in a tuft of scales (except in *rosipara*, Fig. 19); male genitalia with transtillae large and outwardly curving (Figs 93–96) (5 species, Figs 17–21) ..... *asmura* group
- Hind wing with no extension at the distal end of M<sub>3</sub>, transtillae of male genitalia not large, outwardly curving lobes ..... 6
- 6 Wings with ground colour dark green and cream with brown detail, cream areas not separated into distinct blotches (2 species, Figs 37–38) (but not including *obeliscata*, Fig. 53) ..... *includaria* group
- Wings with distinct blotches or with a speckled pattern ..... 7
- 7 Uncus with long apical extension, gnathos fused, sacculus not strongly developed, coremata present (except in *florepecta*, Fig. 87) (7 species, Figs 84–90) ..... *quinquemaculata* group
- Uncus not extended, or gnathos not fused or sacculus strongly developed, coremata absent ..... 8
- 8 Anellar complex a flat plate (2 species, Figs 108–109) ..... *athena* group
- Anellar complex surrounding part of aedeagus .. 9

- 9 Wings with ground colour white with green markings (2 species, Figs 35–36) . *lactecincta* and *sporida*
- Wings predominantly green, with blotches or bands along the termen ..... 10
- 10 Transtillae short arms, fused posteriorly with anellar complex; anellar complex long, with a short dorsal projection (31 species, Figs 117–145) ..... *trilunaria* group
- Transtillae fused with juxta, not extended into short arms, anellar complex without dorsal projection (5 species, Figs 113–116) ..... *albicoma* group

Check-list of the species of *Oospila*

Synonyms are indented and not emboldened.

- OOSPILA* Warren**
- AUOPHYLLA* Warren **syn.n.**
- AUOPHYLLODES* Prout **syn.n.**
- DRUCIA* Warren
- HALIOSCIA* Warren
- LEPTOLOPHA* Warren **syn.n.**
- OOSPILOMA* Prout **syn.n.**
- PROGONODES* Warren **syn.n.**
- RACHEOLOPHA* Warren **syn.n.**
- RHOMBOCHLORA* Warren **syn.n.**
- URUCUMIA* Prout **syn.n.**

- The *flavilimes* group**
- flavilimes* (Warren) **comb.n.**
- decorata* (Prout) **comb.n.**
- nigripunctata* (Warren) **comb.n.**
- permagna* (Warren) **comb.n.**
- [*marginata* (Schaus) preoccupied]
- pallidaria* (Schaus) **comb.n.**
- subaurea* (Warren) **comb.n.**
- acymanta* (Prout) **comb.n.**

- The *quinquemaculata* group**
- quinquemaculata* (Warren)
- circumdata* (Warren) **syn.n.**
- circumdata striolata* Prout **syn.n.**
- continuata* (Warren)
- excrecens* (Warren)
- florepecta* (Warren)
- cayennensis* Herbulot **syn.n.**
- semispurcata* (Warren)
- rhodophragma* Prout
- granulata* (Warren) **comb.n.**

- The *thalassina* group**
- thalassina* Warren
- lacteguttata* (Warren)
- fenestrata* (Bastelberger) **syn.n.**
- peralta* Schaus **syn.n.**

- The *asmura* group**
- asmura* (Druce)
- fumidimargo* (Dognin) **syn.n.**
- latimargo* (Warren) **syn.n.**
- circumsessa* Prout

*rosipara* (Warren)  
*conversa* (Dognin)  
*flavicincta* (Warren) **syn.n.**  
*microspila* (Warren) **syn.n.**  
*delphinata* (Warren)  
*heteromorpha* (Warren) **syn.n.**  
*plurimaculata* (Warren) **syn.n.**  
*plurimaculata symmetrica* Prout **syn.n.**  
*camilla* Schaus

**The astigma group**  
*astigma* (Warren) **comb.n.**  
*leucostigma* (Warren) **comb.n.**  
*delacruzii* (Dognin)  
*restricta* Warren **syn.n.**  
*albipunctulata* (Prout) **comb.n.**  
*rufilimes* (Warren) **comb.n.**  
*extensata* (Warren) **syn.n.**  
*arpata* (Schaus) **comb.n.**  
*mionophragma* (Prout) **syn.n.**  
*mionophragma subrua* (Prout) **syn.n.**  
*semicaudata* (Prout) **syn.n.**  
*similiplaga* (Warren)  
*fimbriatedata* (Warren) **comb.n.**  
*zamaradaria* Fletcher

**The miccularia group**  
*miccularia* (Guenée) **comb.n.**  
*imula* (Dognin)  
*sarptaria* (Möschler) **syn.n.**  
*euchlora* (Prout) **comb.n.**  
*ecuadorata* (Dognin) **comb.n.**  
*sarptaria ruboris* (Prout) **syn.n.**

**The athena group**  
*athena* (Druce) **comb.n.**  
*holochroa* (Prout) **comb.n.**  
*delicatescens* (Dyar) **syn.n.**

***lactecincta* and its relative**  
*lactecincta* (Warren)  
*sporadata* (Warren)  
*curvimargo* Herbulot **syn.n.**

**The includaria group**  
*includaria* (Herrich-Schäffer) **comb.n.**  
*basiplaga* (Warren) **syn.n.**  
*magnifica* (Schaus) **syn.n.**  
*multiplagiata* (Warren) **syn.n.**  
*leucothalera* (Prout) **comb.n.**

**The albicoma group**  
*albicoma albicoma* (Felder and Rogenhofer)  
*deliciosa* Thierry-Mieg **syn.n.**  
*minorata* Warren  
*albicoma nasuta* Warren **stat.n.**  
*concinna* Warren  
*albicoma matura* Prout **syn.n.**  
*eminens* Schaus **syn.n.**  
*dicraspeda* Prout  
*ciliaria* (Hübner)  
*pallida* (Warren) **syn.n.**  
*semialbaria* (Guenée)

**The trilunaria group**  
*trilunaria* (Guenée)  
*carnelunata* (Warren)  
*altonaria* Jones  
*confluaria* (Warren)  
*mesocraspeda* Prout **syn.n.**  
*longipalpis* (Warren)  
*sellifera* Warren  
*lilacina* (Warren)  
*violacea* Warren  
*callicula* (Druce)  
*callicula orchardae* Prout **syn.n.**  
*callicula stenobathra* Prout **syn.n.**  
*obeliscata* (Warren)

***marginata* and its relatives**  
*marginata* Warren  
*marginata sympathes* Prout **syn.n.**  
*rufiplaga* Warren **syn.n.**  
*tricamerata* Prout  
*obsolescens* **stat. n.**

***atopochlora* and its relatives**  
*atopochlora* Prout  
*hyalina* Warren  
*fractimacula* Prout **syn.n.**  
*atroviridis* Warren **stat.rev.**  
*dolens* Druce **syn.n.**  
*congener* Warren  
*congener procellosa* (Warren) **syn.n.**  
*immaculata* **sp.n.**  
*rubescens* (Warren)  
*circumsignata* Prout  
*decoloraria* (Walker)  
*jaspidata* (Warren)  
*longiplaga* Warren  
*lunicincta* (Warren)  
*pellucida* Prout  
*ruptimacula* Warren  
*aliphera* Dognin **syn.n.**  
*ruptimacula curtimacula* Prout **syn.n.**  
*venezuelata* (Walker) **comb.n.**  
*ambusta* (Prout)  
*belisama* (Druce) **syn.n.**  
*invasata* (Walker)  
*partita* (Prout) **syn.n.**  
*venezuelata cellata* (Prout) **syn.n.**  
*confundaria* (Möschler)  
*coerulea* (Warren) **syn.n.**  
*coerulea aphenges* Prout **syn.n.**  
*derasa* (Warren) **syn.n.**  
*sesquiplaga* Prout **syn.n.**  
*depressa* Warren  
*semiviridis* Warren **syn.n.**  
*stagonata* (Felder and Rogenhofer) **comb.n.**  
*arycanda* (Druce) **syn.n.**  
*nivetacta* (Warren) **comb.n.**

## Species descriptions

### The *flavilimes* group

This group has pale and poorly developed abdominal crests and lacks blotches on the wings.

#### *Oospila flavilimes* (Warren) **comb.n.**

(Pl. 1: 1, Figs 1, 78, 146)

*Lissochlora flavilimes* Warren, 1904a: 21. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; S[anto] Domingo, Carabaya, 6000 ft, Nov[ember]. [19]01. wet seas[on]. (Ockenden); Rothschild Bequest B.M. 1939-1; Geometridae genitalia slide No. 14992 ♂. [Examined.]

*Leptolopha flavilimes* (Warren) 1909: 78; Prout, 1912: 128; 1932: 52.

♂, ♀ (Pl. 1: 1, Fig. 1). Fore wing length: 7-9 mm. Antenna of female simple throughout length. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green, blotches absent. Fore wing: costa cream; with narrow yellow band along termen; discal spot small, brown. Hind wing: narrow yellow band along termen; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent from tibia. Abdomen: crests small, cream; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male not strongly sclerotized, with M-shaped apex in male.

**GENITALIA** ♂ (Fig. 78). Uncus short, tapering. Socii disproportionately large. Gnathos: not fused; not reduced; expanded not tapered at apices. Valva: ampulla with broad, denticulate apex; sacculus not extended. Anellar complex: completely surrounding aedeagus, with distinctive shape and extensions. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with small cornutus.

**GENITALIA** ♀ (Fig. 146). Ostium: sterigma absent. Bursa copulatrix: antrum large; ductus bursae long, not strongly sclerotized, not striated; corpus bursae small; signum small. Anterior apophyses very short.

**DIAGNOSIS.** Distinguished from *permagna* by its smaller size and by the fore wing discal spot. In *permagna* the discal 'spot' is a short, thin, green line whereas in *flavilimes* it is a tiny brown spot.

Distinguished from *nigripunctata* and *pallidaria* by the discal spot of the hind wing: in *flavilimes* this spot is white; whereas it is brown in *pallidaria*; *nigripunctata* has a second, brown discal spot, in addition to the white one. Females can also be distinguished from *pallidaria* by their entirely simple antennae. *O. flavilimes* is distinguished from *decorata* only by means of the genitalia (compare Figs 78, 79, 146 and 147), in particular the form of the gnathos and of the anellar complex.

**DISTRIBUTION.** Peru and Brazil.

**MATERIAL EXAMINED.** **Peru:** Puno: Santo Domingo, Carabaya, 1800 m, 1♂ [holotype] wet season, xi.01 (Ockenden); Rio Huacamayo, Carabaya, 940 m, 2♂, dry season, vi.04 (Ockenden). Tinguri, Carabaya, 1000 m, 4♂, dry season, viii.1904 (Ockenden). La Oroya, Rio Inambari, 940 m, 1♂, 1♀, dry season, ix.1904 (Ockenden); 1♀, wet season, x.04 (Ockenden); 1♂, 1♀, ix.1904 (Ockenden); 1♂, wet season, iii.1905 (Ockenden); 1♂, 1♀, ix.05 (Ockenden); 2♂, 2♀, wet season, xi-xii.1905 (Ockenden); 1♂, 1♀, wet season, i.1906 (Ockenden). **Brazil:** Amazonas: Codajas, Upper Amazon, 2♂, iv.1907 (Klages). Fonte Boa, Upper Amazonas, 1♀, vii.1907 (Klages).

*Depository:* BMNH.

#### *Oospila decorata* (Prout) **comb.n.**

(Figs 2, 79, 147)

[*Leptolopha flavilimes* ab. *decorata* Warren, 1909: 78. Infrasubspecific name].

*Leptolopha decorata* Warren, Prout: 1932: 52. Holotype ♂, in BMNH. Type locality: Amazonas. Label data: Type; Fonte Boa, Upp[er] Amazonas, May 1906 (S. M. Klages); Rothschild Bequest B. M. 1939-1; *Leptolopha flavilimes* ab. *decorata* Type ♂ Warr.; Geometridae genitalia slide No. 13474♂. [Examined.]

♂, ♀ (Fig. 2). Fore wing length 8-10 mm. Female antenna simple, throughout length. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark grey-green; blotches absent. Fore wing: costa pale; narrow, pale yellow band along termen, discal spot small, dark brown. Hind wing: narrow, pale yellow band along termen; discal spot short, in form of a thin white line. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: crests small, cream; remainder of dorsal surface green; male lacking brushes of long hair-scales on ster-



num A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 79). Uncus short. Socii large. Gnathos: large, not fused. Valva: apex cleft; ampulla absent; sacculus extended, expanded tip bears small spines. Anellar complex: completely surrounding aedeagus, with distinctive shape. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with small cornutus.

GENITALIA ♀ (Fig. 147). Ostium: sterigma approximately triangular. Distinctive field of long bristles on sternum A8. Bursa copulatrix: ductus bursae with antrum narrow; below antrum ductus short, strongly sclerotized but not striated; corpus bursae small; signum small. Anterior apophyses short.

DIAGNOSIS. Distinguished from *permagna* by its smaller size and by the shape of the discal spot of the fore wing: in *permagna* this is a short, thin, green line whereas in *decorata* it is a tiny brown spot. Distinguished from *nigripunctata* and *pallidaria* by the discal spot of the hind wing: in *decorata* this spot is white. Females can also be distinguished from *pallidaria* by the antenna of the female, which is simple throughout in *decorata* but bipectinate at the base in *pallidaria*. *O. decorata* can be distinguished from *flavilimes* only by the genitalia (compare Figs 78, 79, 146 and 147). The male genitalia of *decorata* are characterised by the large size of the socii and gnathos and by the form of the valvae and anellar complex (Fig. 79). The presence of a field of bristles on the posterior margin of the ostium is distinctive (Fig. 147).

DISTRIBUTION. Known only from French Guiana, and Brazil.

REMARK. *Leptolopha flavilimes* ab. *decorata* Warren is an infra-subspecific name and therefore not available, so the authorship of *decorata* is attributed to Prout (1932).

MATERIAL EXAMINED. **French Guiana:** *Guyane*: St. Jean du Maroni, 1♂, 1♀ (*Le Moult*). **Brazil:** *Amazonas*: Fonte Boa, Upper Amazonas, 1♂ [holotype] v.1906 (*Klages*); 1♂ vi.1906 (*Klages*); Teffe, Upper Amazonas, 1♀, viii.1935 (*Moss*).  
*Depository:* BMNH.

### *Oospila nigripunctata* (Warren) comb.n.

(Figs 3, 80, 148)

*Leptolopha nigripunctata* Warren, 1909: 78.  
 Holotype ♂, in BMNH. Type locality: PERU.  
 Label data: Type; Tinguri, Carabaya, 3400 ft, dry season, August 1904 (G. Ockenden); Rothschild Bequest B.M. 1939-I;  
 Geometridae genitalia slide No. 14243♂.

*Leptolopha nigripunctata* Warren, Prout, 1912: 129; 1932: 52.

♂, ♀ (Fig. 3). Fore wing length 8–11mm. Antenna of female simple throughout length. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches absent. Fore wing: costa cream, with narrow yellow band along termen; discal spot small, dark brown. Hind wing: with narrow yellow band along termen; anterior discal spot small, white, posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long-hair like scales absent from tibia. Abdomen: crests small, cream; remainder of dorsal surface green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male not strongly sclerotized, not modified.

GENITALIA ♂ (Fig. 80). Uncus bifurcate at apex. Socii reduced. Gnathos not fused. Valva: apex cleft; ampulla absent; sacculus extended into long, strongly sclerotized, digitate process; strongly sclerotized, digitate processes arising from base of valva. Anellar complex: narrow, completely surrounding aedeagus. Vinculum: ventral plate broad. Aedeagus: vesica with single cornutus.

GENITALIA ♀ (Fig. 148). Ostium: sterigma distinctive. Bursa copulatrix: antrum large, funnel-shaped; ductus bursae short, strongly sclerotized, not striated; corpus bursae quite large; signum very small. Anterior apophyses short.

DIAGNOSIS. Distinguished from *decorata*, *flavilimes* and *permagna* by the presence of a small, brown discal spot on the hind wing (compare Pl. 1: 1 and Figs 1–4). Distinguished from *pallidaria* by its smaller size and by the genitalia. Females can also be distinguished from *pallidaria* by the entirely simple antennae. The male genitalia can be recognised by the shape of the uncus and the processes extending from the base of the valvae (Fig. 80). The female genitalia can be recognised by the shape of the antrum (Fig. 148).

**DISTRIBUTION.** Recorded from French Guiana, Guyana, Peru and Bolivia.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: St. Jean du Maroni, 1♀ (*Le Moult*). 1♀ (*Bar*). **Guyana:** *East Demerara-West Coast Berbice*: Demerara, 1♀, 1909–1948 (*Rodway*). **Peru:** *Puno*: Tinguri, Carabaya, 1000 m, 1♂ [holotype] dry season, viii.1904 (*Ockenden*).; 1♂, dry season, viii.1904 (*Ockenden*). La Oroya, Rio Inambari, S. E. Peru, 940 m, 2♀, wet season, iii.1905 (*Ockenden*); 1♀, wet season, xi–xii.1905 (*Ockenden*). Rio Huacamayo, 940 m, 2♂, vi.1904 (*Ockenden*). La Union, Rio Huacamayo, Carabaya, 610 m, 1♂ [syntype] wet season, xi.1904 (*Ockenden*). Santo Domingo, Carabaya, 2000 m, 1♂, dry season, x.1902 (*Ockenden*). **Bolivia:** *Cochabamba*: Yungas del Espiritu Santo, 1♂, 1888–1889 (*Germain*).

*Depository*: BMNH.

### *Oospila permagna* (Warren) **comb.n.**

(Figs 4, 149)

*Leptolopha permagna* Warren, 1909: 79. LECTOTYPE ♀, here designated, in BMNH. Type locality: PERU. Label data: Type; Tinguri, Carabaya, 3400 ft, dry season, August 1904 (G. Ockenden); *Leptolopha permagna* type ♀ Warr.; Rothschild Bequest B.M. 1939–I.; Geometridae genitalia slide No. 14131♀. [Examined.]

*Leptolopha permagna* Warren, Prout, 1912: 129; 1932: 51.

*Leptolopha marginata* Schaus, 1912b: 292; Prout, 1932: 52. Holotype, ♀ in USNM. Type locality: COSTA RICA: Tuis. Label data: June 07; Tuis CR 2400 ft; Collection Wm Schaus; *Leptolopha* n.sp., between *flavilimes* Wrrn XI.21 × *permagna* Warr. XVI.79; *Leptolopha marginata* type Schs; Type No. 17732 U.S.N.M. [Examined.] [A junior secondary homonym of *marginata* Warren (1897).]

♀ (Fig. 4). Fore wing length 12–13 mm. Antenna of female simple throughout length. Frons brown, vertex white. Interantennal fillet white. Thorax: dorsal surface pale green. Wings: ground colour pale green; blotches absent. Fore wing: with narrow yellow band along termen; discal spot small, brown. Hind wing: with narrow yellow band along termen; discal spot short, thin, pale yellow line. Hind leg: proximal spurs absent. Abdomen: crests small, cream, with some brown scales on outer sides; remainder of dorsal surface cream.

**GENITALIA** ♂. Unknown.

**GENITALIA** ♀ (Fig. 149). Ostium: sterigma absent. Bursa copulatrix: antrum indistinct; ductus bursae quite long, not strongly sclerotized, not striated; corpus bursae large, narrow; signum small. Anterior apophyses unusually long.

**DIAGNOSIS.** *Oospila permagna* is larger than *decorata*, *flavilimes* and *nigripunctata* and can also be distinguished from these species by the larger size and colour of the discal spots. In *permagna* the fore wing discal spot is a short, thin green line and the hind wing discal spot is a longer, thin yellow line. Distinguished from *pallidaria* by the white discal spot on the hind wing: in *pallidaria* this is brown; also the fore wing discal spot of *pallidaria* is smaller and darker. Females can also be distinguished from *pallidaria* by the presence of antennae that are simple throughout their length.

**DISTRIBUTION.** Known to occur in Peru, Costa Rica and Brazil.

**MATERIAL EXAMINED.** **Costa Rica:** Tuis, 1♀ [holotype of *marginata*]. **Peru:** *Puno*: Tinguri, Carabaya, 1000 m, 1♀ [lectotype of *permagna*] dry season, viii.1904 (*Ockenden*); 1♀ [paralectotype of *permagna*] dry season, viii.1904 (*Ockenden*); La Oroya, R. Inambari, 940 m, 1♀, wet season (*Ockenden*); 1♀, wet season, xi–xii.1905 (*Ockenden*). **Brazil:** *Santos*: Alto da Serra, 800 m, 1♀, 28.ii.1913 (*Jones*).

*Depositories*: BMNH, USNM.

### *Oospila pallidaria* (Schaus) **comb.n.**

(Figs 5, 81, 150)

*Comostola pallidaria* Schaus, 1897: 161. Holotype ♂, in USNM. Type locality: BRAZIL. Label data: Castro, Parana; *Comostola pallidaria* Type. Schs; Collection Wm Schaus; Type No. 11896 U.S.N.M. [Examined.]

*Leptolopha pallidaria* (Schaus) Prout, 1912: 129; Prout, 1932: 52.

♂, ♀ (Fig. 5). Fore wing length 10–13 mm. Antenna of female bipectinate. Frons brown, vertex cream. Interantennal fillet white. Thorax: dorsal surface cream. Wings: ground colour pale green, blotches absent. Fore wing: costa cream; with narrow white or pale yellow band along termen; discal spot small, brown. Hind wing: narrow white or pale yellow band along termen, discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent from tibia. Abdomen: crests small, cream; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; ellip-



tical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male, with bifurcate posterior extension.

**GENITALIA** ♂ (Fig. 81). Uncus not extended. Socii large. Gnathos not fused. Valva: complex; costa with short, triangular extension below apex; ampulla long and narrow; sacculus extended into very short, strongly sclerotized, pointed process. Anellar complex: completely surrounding aedeagus; basal part distinctive, as in Fig. 81. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with large cornutus.

**GENITALIA** ♀ (Fig. 150). Ostium: sterigma absent. Bursa copulatrix: antrum absent; ductus bursae fairly short, strongly sclerotized, not striated; corpus bursae small; signum absent. Anterior apophyses quite long.

**DIAGNOSIS.** The presence of pectinate antennae in the female allows this sex to be distinguished from that of *decorata*, *flavilimes*, *nigripunctata* and *permagna*. Both sexes are distinguished from these species by the presence of a small, brown discal spot on the hind wings, the others having a white discal spot (compare Pl. 1: 1 and Figs 1–5). *Oospila pallidaria* can be distinguished from *nigripunctata* by the presence of only a single discal spot on the hind wing: in *nigripunctata* there are two (compare Figs 3 and 5). The male genitalia can be recognised by the form of the valvae and anellar complex (Fig. 81).

**DISTRIBUTION.** Recorded from Argentina, Bolivia, Paraguay and Brazil.

**MATERIAL EXAMINED.** **Argentina:** Misiones: Rio Parana, 1? (*Le Moult*). **Bolivia:** Santa Cruz: Buenavista, East Bolivia, 1♂, vii.–x.1906 (*Steinbach*). **Paraguay:** Paraguay central, 1?, 1885 (*Germain*). **Brazil:** Petropolis, 1♂, 1♀, 1888 (*Germain*); 1♀. 1♂ (*Germain*). Minas Geraes: Uberaba, 19♂, 3♀, 1? (*Le Moult*). Sao Paulo: Santos, 1♀. 1♂, 2♀, 5? *Parana:* Castro, 890 m, 1♂ [holotype]; 2♂, 1? (*Jones*); 1♂, v.01 (*Jones*). Fernandes Pinheiro, 800 m, 1♂, iv.1910 (*Jones*). Rio de Janeiro: Organ Mts, near Tijunca, 1♀, 1902 (*Wagner*). 1?

*Depositories:* BMNH, USNM.

### *Oospila subaurea* Warren comb.n.

(Figs 6, 82)

*Comibaena subaurea* Warren, 1907: 201. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; Tinguri, Carabaya, 3400 ft,

dry season], August 1904. (G. Ockenden).; Rothschild Bequest B.M. 1939–1; Geometridae genitalia slide No. 13768 ♂. [Examined.]

*Leptolopha subaurea* Warren, Prout, 1932: 51.

♂ (Fig. 6). Fore wing length 11–13 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour yellow with green speckling concentrated at wing base; blotches absent; markings dark green. Fore wing: costa cream, speckled with green; area of solid green at apex and along termen, termen with brown margin; discal spot large, dark green. Hind wing: broad green band along termen, fringed with brown along wing margin; wing base with some green speckling; discal spot small, dark brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent from tibia. Abdomen: crests small, very pale green; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male not strongly sclerotized; simple.

**GENITALIA** ♂ (Fig. 82). Uncus not extended. Socii large. Gnathos reduced, not fused. Valva: ampulla absent; sacculus with sub-apical extension. Anellar complex approximately V-shaped, not completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀. Unknown.

**DIAGNOSIS.** This species can be recognised by the yellow ground colour of the wings. The male genitalia can be recognised from the large socii and the shape of the anellar complex (Fig. 82).

**DISTRIBUTION.** The two specimens examined are from Peru.

**MATERIAL EXAMINED.** **Peru:** Puno: Tinguri, Carabaya, 1000 m, 1♂ [holotype] dry season, viii.1904 (*Ockenden*); 1♂ dry season, viii.1904 (*Ockenden*).

*Depository:* BMNH.

### *Oospila acymanta* (Prout) comb.n.

(Figs 7, 83)

*Urucumia acymanta* Prout, 1933: 71 pl 8k. LECTOTYPE ♂, here designated, in BMNH. Type locality: BRAZIL. Label data: Type HT; 39 27 Urucum, 15 miles S. of Corumbá, 650 ft, 19.iv.27. Matto Grosso C. L. Collenette; Uru-



cumia acymanta ♂ type Prout; Geometridae genitalia slide No. 14807 ♂. [Examined.]

♂ (Fig. 7). Fore wing length 6–8 mm. Frons and vertex dark brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: pale green; unmarked except for small, brown discal spot. Hind wing: frenulum absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal two crests pale brown, more distal crests cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane A2–A3; sternum A8 with M-shaped apical edge.

GENITALIA ♂ (Fig. 83). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; ampulla absent; sacculus extended into long, pointed process. Anellar complex reduced to strongly developed juxta with two long, narrow posterior extensions. Vinculum: ventral plate emarginated. Aedeagus: vesica with single cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. Distinguished from *immaculata* by its smaller size and by the presence of a brown discal spot on the wings; *immaculata* has no discal spot on the hind wings. The male genitalia of *acymanta* can be recognised by the shape of the juxta (Fig. 83).

DISTRIBUTION. Known only from Brazil.

MATERIAL EXAMINED. **Brazil:** *Mato Grosso:* Urucum, 15 miles S. of Corumba, 200–275 m, 2♂ [paralectotypes] 18.iv.27 (*Collenette*); 1♂ [lectotype] 19.iv.27 (*Collenette*); 1♂ [paralectotype] 21.iv.27 (*Collenette*); 2 ♂ [paralectotype] 1886 (*Germain*).

Depository: BMNH.

### The *quinquemaculata* group

The *quinquemaculata* group is characterised by four characters of the male genitalia. The uncus has a long apical extension, the gnathos are fused, coremata are present (except in *florepecta*) and the sacculus is not strongly developed. This group is distinguished from the *thalassina* group by the absence of a proximal pair of spurs on the hind tibia.

#### *Oospila quinquemaculata* (Warren)

(Figs 8, 84, 151)

*Drucia quinquemaculata* Warren, 1906: 416.

Holotype ♀, in USNM. Type locality: FRENCH GUIANA. Label data: S[ain]t Jean, Maroni, F[rench] Guiana; *Drucia quinquemaculata* type ♀; Type No. 9177 U.S.N.M.; Collection Wm Schaus; Genitalia Slide By MAC 57765 USNM. [Examined.]

*Oospila quinquemaculata* (Warren); Prout, 1912: 134; 1933: 58.

*Drucia circumdata* Warren, 1907: 202. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Oroya, R[io] Inambari, S[outh] E[ast] Peru, 3100 ft, wet season, Oct[ober] 1904. (G. Ockenden); *Drucia circumdata* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15685 ♂. [Examined.] **Syn.n.**

*Oospila circumdata* (Warren); Prout, 1912: 134; 1933: 58.

*Oospila circumdata striolata* Prout, 1918a: 118; 1933: 58. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type H[olo] T[ype], Río Ampiyacu, Putomayo, Peruv[ian] Amaz[onas]; Det[ermined] by L.B. Prout; Joicey Bequest. Brit[ish] Mus[eam] 1934–120; *Oospila circumdata striolata* ♂ type Prout; Geometridae genitalia slide No. 15686 ♂. [Examined.] **Syn.n.**

♂, ♀ (Fig. 8). Fore wing length 12–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown or pale brown with darker brown centres. Fore wing: costa pale brown; blotch at apex large, extending to costa, connected to blotch at tornus by narrow band along termen; blotch at tornus small; discal spot small, brown. Hind wing: blotches at apex and tornus connected by narrow band along termen, sometimes joined to blotch at anal margin by narrow band along anal margin; blotch at anal margin small, narrow; discal spot usually small, brown, occasionally absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown or reddish brown; sternum A2 of male without brushes of long hair-scales posteriorly; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 84). Uncus long, pointed. Socii large. Gnathos: fused, not reduced. Valva: costa more strongly sclerotized; ampulla short, pointed; sacculus not extended. Anellar complex: completely surrounding aedeagus. Vincu-

lum: broad, ventral plate, sometimes W-shaped, sometimes U-shaped, with posterior projection. Coremata present. Aedeagus: vesica with large cornutus.

GENITALIA ♀ (Fig. 151). Ostium: sterigma absent, but membrane laterad of ostium with extra sclerotization and folded to form pouch. Bursa copulatrix: complex of ductus bursae and corpus bursae large, with short striations and convoluted folds, antrum absent; signum small. Anterior apophyses quite long.

DIAGNOSIS. Although rather similar to *continua* in external appearance, *quinquemaculata* can be distinguished by the narrow band along the termen connecting the blotches at the apex and the tornus, in *continua* this band is much broader (compare Figs 8 and 9). Moreover, the apical blotch of *quinquemaculata* is rounded whereas that of *continua* is indented.

The absence of an extension of the hind wing at the apex of vein  $M_3$  of the hind wing distinguishes *quinquemaculata* from *asmura* (compare Figs 8 and 17). The form of the anellar complex distinguishes males of *quinquemaculata* from those of *asmura* and *continua* (compare Figs 84, 85 and 93).

The female genitalia can be recognised by the unusual shape and convoluted folds of the bursa copulatrix (Fig. 151).

DISTRIBUTION. Recorded in Costa Rica, French Guiana, Peru, Bolivia, and northern parts of Brazil.

MATERIAL EXAMINED. **Costa Rica:** Guanacaste: Derrumbe, Estacion Mengo, West side Volcan Cacao, 1400 m, 1♀, 5.vi.1988 (Janzen, Hallwachs); Estacion Pitilla, 9 km South of Santa Cecilia, 700 m, 1♀, xi.1989 (Moraga, Rios). **French Guiana:** Guyane: Godebert-Maroni, 1♂ (Le Moult); St. Jean du Maroni, 1♀ [holotype of *quinquemaculata*]. **Peru:** Loreto: Rio Ampiyacu, 1♂ [holotype of *circumdata striolata*]. Puno: South East Peru, La Oroya, Rio Inambari, 940 m, 1♀, wet season, x.1904 (Ockenden); 1♂ [holotype of *circumdata*] wet season, x.1904 (Ockenden); 1♂, ix.05 (Ockenden); 2♂, wet season, xi–xii.1905 (Ockenden). **Bolivia:** Santa Cruz: Provincia del Sara, 450 m, 1♂ vii.1914 (Steinbach). **Brazil:** Amazonas: Upper Amazon, Codajas, 1♀ [paratype of *circumdata striolata*] iv.1907 (Klages).

Depositories: BMNH, CMNH, INBio, USNM.

## *Oospila continua* (Warren)

(Figs 9, 85, 152)

*Racheolopha continua* Warren, 1906: 422. Holotype ♀, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: S[ain]t Laurent du Maroni, xii.1904; Schaus Coll[ection]; Type No. 9190 U.S.N.M. [Examined.]

*Oospila continua* (Warren); Prout, 1933: 58.

♂, ♀ (Fig. 9). Fore wing length 9–10 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings brown. Fore wing: costa pale brown; blotch at apex indented at apex, connected to blotch at tornus by broad band along termen; blotch at tornus quite small; discal spot small, brown. Hind wing: blotch at apex long, thin, extending halfway along termen, connected to blotch at tornus by narrower band along termen; blotch at tornus connected to blotch at anal margin by narrower band along anal margin; blotch at anal margin short, narrow; discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales present. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; sternum A2 with brushes of long hair-scales in male; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 85). Uncus long, expanded at apex. Socii large. Gnathos: fused, not reduced. Valva: costa with shallow cleft subapically; short, subapical digitate projection near costa; ampulla short, with tip cleft; sacculus not extended. Anellar complex completely surrounding aedeagus; extending posteriorly as a broad tongue-shaped plate (broader than in *depressa*, Fig. 143). Vinculum: ventral plate broad, rounded. Coremata present. Aedeagus short, squat; vesica lacking cornutus.

GENITALIA ♀ (Fig. 152). Ostium: with shallow internally-directed pocket on each side; sterigma absent. Bursa copulatrix: ductus bursae quite short, not strongly sclerotized or striated, antrum absent; corpus bursae large; signum small. Anterior apophyses quite long.

DIAGNOSIS. *Oospila continua* is rather similar in external appearance to *quinquemaculata*, from which it may be distinguished by the broad band along the termen connecting the blotches at the apex and tornus (compare Figs 8 and 9). Also,



*continuata* has a distinct apical indentation of the blotch at the apex of the fore wing, whereas the blotch is more rounded in *quinquemaculata*.

The narrower and more uniform band of brown along the termen of the wings and the absence of a brick-red marking at the base of the fore wing distinguish *continuata* from *excrecens* (compare Pl. 1: 2, Figs 9 and 10).

*Oospila continuata* may be distinguished from *circumsessa* by the extension of the brown markings along the anal margin of the hind wing and by the absence of a short extension of the hind wing at the apex of vein  $M_3$  (compare Figs 9 and 18).

The male genitalia of *continuata* can be recognised by the extension of the posterior part of the anellar complex into a broad, tongue-shaped plate, and by the shape of the valvae (Fig. 85).

**DISTRIBUTION.** Five specimens were examined, four from the Guyane region of French Guiana and a single specimen from the Amazonas region of Brazil.

**MATERIAL EXAMINED.** **Brazil:** Amazonas: Fonte Boa, 1♂, viii.1907 (*Klages*). **French Guiana:** Guyane: St. Jean du Maroni, 1♀, 1? (*Le Mout*); St. Laurent du Maroni, 1♀ [holotype] xii.1904; 1?

*Depositories:* BMNH, USNM.

### *Oospila excrecens* (Warren)

(Pl. 1: 2, Figs 10, 86, 153)

*Drucia excrecens* Warren, 1906: 415. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], Saint Jean, vii.1904 (Schaus Coll); Type No. 9176 U.S.N.M. [Examined.]

*Oospila excrecens* (Warren); Prout, 1912: 134; 1933: 59.

♂, ♀ (Pl. 1: 2, Fig. 10). Fore wing length 9–10 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface reddish brown. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; blotch at apex large, extending to costa, connected to blotch at tornus by narrower band along termen; additional blotch at wing base or 1/3 along anal margin; discal spot small, reddish. Hind wing: with blotches at apex and tornus connected by narrower band along termen, extended along anal margin and connected to blotch at anal margin; blotch at anal margin, small, narrow; discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen:

basal crests dark brown, distal crests paler; remainder of dorsal surface reddish-brown; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male not strongly sclerotized, simple.

**GENITALIA** ♂ (Fig. 86). Uncus long, widening at apex. Socii large. Gnathos fused, shape resembles that of uncus. Valva: ampulla short, triangular; large curved, denticulate sclerite occurring basad of ampulla; sacculus not extended. Anellar complex: completely surrounding aedeagus, fused to valvae posteriorly. Vinculum: ventral plate U-shaped with medial projection. Coremata present. Aedeagus: vesica with long cornutus.

**GENITALIA** ♀ (Fig. 153). Ostium: with surrounding membrane having convoluted folds; sterigma absent. Bursa copulatrix: ductus bursae long, antrum small and strongly sclerotized; striated below antrum; corpus bursae large; signum very small. Anterior apophyses quite long.

**DIAGNOSIS.** *Oospila excrecens* is easily recognised by the presence of a brick-red blotch at the base of the fore wing (Pl. 1: 2). The valva of *excrecens* has a distinctive ampulla and a denticulate sclerite (Fig. 86).

**DISTRIBUTION.** Most of the specimens examined were collected from French Guiana and Brazil, but two male specimens came from Peru.

**MATERIAL EXAMINED.** **French Guiana:** Guyane: Haut Maroni, La Forestiere, 1♀ (*Le Mout*); Nouveau Chantier, 1♀; St. Jean du Maroni, 1♂ [holotype]; 2 ♂; St. Laurent du Maroni, 1♂, 1♀; 1♂. **Peru:** Madre de Dios: Tambopata Reserve, 30 km South West of Puerto Maldonado, 300 m, 2♂, 16–22.x.1983 (*Covell*). **Brazil:** Amazonas: Fonte Boa, 1♂, v.06 (*Klages*); 4♂, ix.06 (*Klages*); Teffe, Egas, 1♂.

*Depositories:* BMNH, CVCJ, USNM.

### *Oospila florepicta* (Warren)

(Pl. 1: 3, Figs 11, 87, 154)

*Racheolopha florepicta* Warren, 1906: 424. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni, Saint Jean, iv.1904; Schaus Coll[ection]; Type No. 9194 U.S.N.M. [Examined.] [*Oospila florepicta* ab. *pulchripicta* Prout, 1918b: 82. Infra-subspecific name.]

*Oospila florepicta* (Warren); Prout, 1933: 57.

*Oospila cayennensis* Herbulot, 1991: 108. Holotype ♂, in HERB. Type locality: FRENCH



GUIANA. Label data: Piste Nancibo Pk 6 28–III–1990; Guyane Francaise environs de Cayenne H. de Toulgoët; Pr. No6646 C. Herbulot; *Oospila cayennensis* H[e]rb[u]l[o]t Holotype. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 3, Fig. 11). Fore wing length 13–16 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings brown (orange-brown in form *cayennensis*, reddish brown in form *pulchripicta*), or with dark brown centres surrounded by paler brown or yellow. Fore wing: costa pale brown; blotches at apex and tornus approximately circular, not connected by band along termen; discal spot small, dark, same colour as blotches. Hind wing: subapical blotch and blotch at tornus approximately circular, not connected by band along termen, nor connected to blotch at anal margin; marking (a modified blotch) at anal margin small, narrowed; discal spot small, dark, same colour as blotches. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface dark coloured (same colour as wing markings); male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 not strongly sclerotized, simple.

**GENITALIA** ♂ (Fig. 87). Uncus long. Socii quite large. Gnathos fused, resembling shape of uncus. Valva: costa more strongly sclerotized, with small subapical extension; ampulla broad, with serrated apex; shallow notch usually occurring just below ampulla; sacculus not extended, typically without denticulate margin (as illustrated in Fig. 87), sometimes irregularly shaped with denticulate margin. Anellar complex: V-shaped. Vinculum: ventral plate typically weakly emarginated, sometimes rounded. Coremata absent. Aedeagus: vesica with large cornutus.

**GENITALIA** ♀ (Fig. 154). Ostium: sterigma absent. Bursa copulatrix: antrum indistinct; ductus widening distally, strongly sclerotized and striated; corpus bursae large; signum small. Anterior apophyses quite long.

**DIAGNOSIS.** The intricate pattern of the blotches makes most specimens of *florepecta* instantly recognisable. However, some colour variants of this species are close to *rosipara*, from which they can be distinguished by the presence of blotches at the tornus of both the fore and hind wings (compare Pl. 1: 3, Figs 11 and 19). The male

genitalia of *florepecta* can be recognised by the shape of the ampulla (Fig. 87).

**DISTRIBUTION.** Specimens were examined from French Guiana, Colombia and northern areas of Brazil.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane:* Godebert Maroni, 1♀ (*Le Moulit*); St. Jean du Maroni, 1♂ (*Le Moulit*); 1♂ [holotype of *florepecta*] iv.1904; Environs de Cayenne, piste Nancibo PK 6, 1♂ [holotype of *cayennensis*] 28.iii.1990 (*Toulgoët*); Piste Changement PK 1, 1♀ [paratype of *cayennensis*] 27.iv.1989 (*Toulgoët*, *Navatte*, *Lalanne-Cassou*). **Colombia:** Camea Valley, 1200 m, 1♂ [no date] (ex coll. *Johnson*); C.C.Hq., Bajo Calima, 90 m, Valle 1♂, 12.i.1985 (*Sullivan*). **Brazil:** Para, vi.1923 (*Lemmer Coll. from Buchholz*); Para, 1♂ (*Moss*). *Amazonas:* Fonte Boa, 2♂, v.1906 (*Klages*); 1♀, vi.1907 (*Klages*).

*Depositories:* AMNH, BMNH, HERB.

### *Oospila semispurcata* (Warren)

(Figs 12, 88, 155)

*Drucia semispurcata* Warren, 1906: 416. Holotype ♀, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], Saint Jean, vii.1904 (*Schaus Coll[ection]*); Type No. 9179 U.S.N.M. [Examined.]

*Oospila semispurcata* (Warren); Prout, 1912: 134; 1933: 59.

♂, ♀ (Fig. 12). Fore wing length 12–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; speckled with brown except at apex of fore wing and wing base of fore and hind wing; blotches absent; discal spot of fore and hind wing small, brown; fore wing with costa pale brown. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male with brushes of long hair-scales on sternum A2; elliptical sclerite present in intersegmental membrane of A2 and A3 of male; sternum A8 not strongly sclerotized, simple.

**GENITALIA** ♂ (Fig. 88). Uncus long. Socii large. Gnathos fused. Valva: costa emarginated subapically; ampulla quite long, expanded to denticulate apex; sacculus not extended. Anellar complex V-shaped, with two separate ventral plates; not surrounding aedeagus completely.

Coremata present. Vinculum: ventral plate weakly emarginated with narrow medial projection. Aedeagus: vesica with small cornutus.

**GENITALIA ♀** (Fig. 155). Ostium: sterigma forming ring around ostium; broad medial pocket and smaller pocket present on each side. Bursa copulatrix: large, antrum and ductus bursae indistinct, with some striation at posterior; signum small. Anterior apophyses short.

**DIAGNOSIS.** The pale brown colour of the costa and the rounded apex of the hind wings distinguishes *semispurcata* from *granulata* the only other species that has its wings speckled with brown (compare Figs 12 and 14). The male genitalia of *semispurcata* can be recognised by the shape of the ampulla and the anellar complex (Fig. 88). The female genitalia can be recognised by the arrangement of pockets surrounding the ostium (Fig. 155).

**DISTRIBUTION.** All specimens examined were collected in the Guyane region of French Guiana.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: St. Jean du Maroni, 1♂, 1♀ (*Le Mout*); 1♂, 1♀ [holotype] vii.1904; 3♀; St. Laurent du Maroni, 1♂.

*Depositories:* BMNH, USNM.

### *Oospila rhodophragma* Prout

(Pl. 1: 4, Figs 13, 89)

*Oospila rhodophragma* Prout, 1916: 170; 1933: 59. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; Codajas, Upper Amazon, April 1907 (S.M. Klages); Rothschild Bequest B[ritish] M[useum] 1939-1; fig [d] in Seitz VIII; *Oospila rhodophragma* ♂ type Prout; Geometridae genitalia slide No. 15731♂. [Examined.]

♂ (Pl. 1: 4, Fig. 13). Fore wing length 12 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches absent. Fore wing: costa white, with brown line inside and parallel to costa; with narrow white band along termen, marked with small brown patches at ends of veins; with parallel brown line inside white band; discal spot small, brown. Hind wing: narrow white band along termen, penetrated at points by brown line proximal to this; parallel brown line inside white band; discal spot small, brown. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface green; lacking brushes of long hair-scales on sternum

A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 not strongly sclerotized, simple.

**GENITALIA ♂** (Fig. 89). Uncus long. Socii large. Gnathos: fused, not reduced. Valva: ampulla long, narrow; sclerite basal of ampulla rounded with apex denticulate; sacculus extended slightly to broad, rounded lobe, not strongly sclerotized. Anellar complex: completely surrounding aedeagus. Coremata present. Vinculum: ventral plate broad, U-shaped. Aedeagus: vesica striated and lacking cornutus.

**GENITALIA ♀.** Unknown.

**DIAGNOSIS.** The white colour of the fore wing costa and absence of other markings distinguishes *rhodophragma* from other species of *Oospila*. The male genitalia of *rhodophragma* can be recognised by the shape of the ampulla and the sclerite basal to it on the valva (Fig. 89).

**DISTRIBUTION.** Known only from one specimen, which was collected in Brazil.

**MATERIAL EXAMINED.** **Brazil:** *Amazonas*: Upper Amazon, Codajas, 1♂ [holotype] iv.1907 (*Klages*).

*Depository:* BMNH.

### *Oospila granulata* (Warren) **comb.n.**

(Figs 14, 90)

*Rhombochlora granulata* Warren, 1909: 89. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; Fonte Boa, Amazonas, July 1906, (S. M. Klages); Rothschild Bequest B.M. 1939-1; fig in Seitz 8; *Rhombochlora granulata* type ♂ Warr.; Geometridae genitalia slide No. 15810 ♂.

♂ (Fig. 14). Fore wing length 14 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface pale, reddish brown. Wings: ground colour dark green; speckled with reddish brown, blotches absent. Fore wing: costa white; with white line along basal part of termen; brown speckling most concentrated at tornus; discal spot small, brown. Hind wing: white line along termen towards apex; discal spot small, brown. Abdomen: basal crests dark brown with mesal, long, green, hair-like scales (unlike in all other species of *Oospila*); remainder of dorsal surface green; lacking brushes of long, hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3, sternum A8 not strongly sclerotized, simple.

**GENITALIA ♂** (Fig. 90). Uncus long. Socii large.



Gnathos fused, not reduced. Valva: ampulla absent; sacculus extended to short, robust, apical process; facing edges of valvae strongly sclerotized, denticulate. Anellar complex reduced to strongly developed juxta, with two long, narrow posterior extensions. Coremata present. Vinculum: ventral plate broad, U-shaped. Aedeagus: vesica with small cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. The white costa and the green scales in the middle of the abdominal crests are features distinguishing *granulata* from *semispurcata*. The male genitalia of *granulata* can be recognised by the modification of the facing edges of the valvae (Fig. 90).

DISTRIBUTION. Known only from one specimen, which was collected in Brazil.

MATERIAL EXAMINED. **Brazil:** Amazonas: Fonte Boa, 1 ♂ [holotype] vii.1906 (*Klages*).

Depository: BMNH.

### The *thalassina* group

The *thalassina* group is distinguished by a suite of characters. There are two pairs of spurs on the male hind tibia; sternum A8 in the male is not strongly sclerotized, and not extended posteriorly. In the male genitalia the uncus is long and the gnathos fused. The male valvae are simple and lacking an ampulla, and the sacculus of the valva is not extended in this group.

### *Oospila thalassina* Warren

(Figs 15, 91)

*Oospila thalassina* Warren, 1905: 318; Prout, 1912: 134. Holotype ♂, in BMNH. Type locality: PERU. Label data: Cuzco, Peru, April 1901. (Garlepp); Rothschild Bequest B[ritish] M[useum] 1939-I; *Oospila thalassina* type ♂ Warr[en]; Geometridae genitalia slide No. 16309 ♂. [Examined.]

*Oospiloma thalassina* (Warren); Prout, 1916: 170; 1932: 55.

♂ (Fig. 15). Fore wing length 13–16 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings dark brown. Fore wing: costa dark brown; subapical blotch and blotch at tornus small, joined by narrow band along termen; discal spot large, brown. Hind wing: blotches absent; termen with narrow band; anterior discal spot small, white; posterior discal spot small, brown. Hind leg: proximal

spurs present; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 with brushes of long hair-scales absent; elliptical sclerite absent from intersegmental membrane between A2 and A3; sternum A8 not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 91). Uncus long, broadening slightly at apex. Socii large. Gnathos: fused, not reduced. Valva: ampulla absent; sacculus lobed. Anellar complex: shape distinctive; completely surrounding aedeagus; extended posteriorly into short tongue-like process (observed by gnathos and dotted in Fig. 91). Vinculum: ventral plate broad, U-shaped, with short medial projection. Coremata present. Aedeagus small, short and squat; cornutus absent.

GENITALIA ♀. Unknown.

DIAGNOSIS. The wing markings of *Oospila thalassina* are similar to those of *confluaria* and *dicraspeda* (compare Figs 15, 42 and 47), but *thalassina* may be distinguished by the presence of a proximal pair of spurs on the hind tibia. The simple sternum A8, long uncus, fused gnathos, and the presence of coremata distinguish males of *thalassina* from those of the other two species (compare Figs 91, 115 and 120). The wing markings differ from those of *lacteguttata*, which is the only other species of *Oospila* with proximal spurs on the hind tibia (compare Figs 15 and 16).

DISTRIBUTION. An Andean species, collected in Peru and Bolivia.

MATERIAL EXAMINED. **Peru:** 2 ♂ (*Le Moult*). Amazonas: Huambo, 7 ♂, IV<sup>tr</sup> Trimestre 1889 (*Mathan*). Cuzco: 1 ♂ [holotype] iv.1901 (*Garlepp*); Avispas, Madre de Dios, 2 ♂, 10–20.x.1962 (*Pena*). Puno: La Oroya, Rio Inambari, 940 m, 1 ♂, dry season, ix.01 (*Ockenden*). **Bolivia:** 1 ♂ (*Germain*).

Depositories: AMNH, BMNH.

### *Oospila lacteguttata* (Warren)

(Figs 16, 92)

*Racheolopha lacteguttata* Warren, 1909: 85. LECTOTYPE ♂, here designated, in BMNH. Type locality: PERU. Label data: Huanabamba, Cerro de Pasco (E. Boettger); Rothschild Bequest B[ritish] M[useum] 1939-I; *Racheolopha lacteguttata* type ♂ Warr[en]; Geometridae genitalia slide No. 16308 ♂. [Examined.]

*Oospila lacteguttata* (Warren); Prout, 1912: 134.

*Oospiloma lacteguttata* (Warren); Prout, 1916: 170; 1932: 54.

*Progonodes fenestrata* Bastelberger, 1911: 54; Prout, 1912: 132. Holotype ♂, in Senckenberg Museum. Type locality: PERU. Label data: fenestrata Bastelb[erger]; Typus; Coll[ection] Bastelberger. [Not examined.] **Syn.n.**

*Oospiloma fenestrata* (Bastelberger); Prout, 1932: 54.

*Oospila peralta* Schaus, 1912b: 287. LECTO-TYPE ♂, here designated, in USNM. Type locality: COSTA RICA. Label data: Feb[r]uary] 07; Peralta 2000 ft C[osta] R[ica]; Collection Wm Schaus; Type No. 17720 U.S.N.M.; *Oospila peralta* type Sch[au]s; Genitalia Slide By MAC 57761 USNM. [Examined.] **Syn.n.**

*Oospiloma* (?) *peralta* (Schaus); Prout, 1916: 170; 1932: 55.

♂ (Fig. 16). Fore wing length 11–13 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches absent. Fore wing: costa pale brown; cream band along termen, brown band proximal and parallel to cream band; white spots marking apices of veins; discal spot small, brown. Hind wing: markings on termen as for fore wing; discal spot small, white. Hind leg: proximal spurs present on tibia; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface green; sternum A2 with brushes of long hair-scales absent; elliptical sclerite absent from intersegmental membrane between A2 and A3; sternum A8 not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 92). Uncus long, slightly expanded at apex. Socii large. Gnathos: fused, not reduced. Valva: with shallow subapical cleft; narrowing towards apex; ampulla absent; margin of sacculus lobed. Anellar complex: shape distinctive. Vinculum: ventral plate broad with medial projection. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. The presence of proximal spurs on the hind tibia distinguishes *lacteguttata* from other species of *Oospila* (except for *thalassina*, a species easily distinguished by means of the wing markings, compare Figs 15 and 16). *Oospila lacteguttata* can be distinguished from *immaculata* by the presence of a brown discal spot on the fore wings (compare Figs 16 and 61) and from *holochroa* by the presence of a single discal spot only on the hind wings (compare Figs 16 and 34).

The long uncus, fused gnathos and the form of the anellar complex also distinguish males of *lacteguttata* from the other species (compare Figs 91, 92, 109 and 133).

DISTRIBUTION. Material has been examined from Costa Rica, Colombia and Peru.

MATERIAL EXAMINED. **Costa Rica:** Cartago: Peralta, 610 m, 1♂ [lectotype of *peralta*] ii.07. **Colombia:** Meta: East Colombia: Upper Rio Negro, 1♂ (*Fassl*). **Peru:** Cajamarca: Huanabamba, Cerro de Paseo, 1♂ [lectotype of *lacteguttata*] (*Boettger*); 1♂ [paralectotype of *lacteguttata*] (*Boettger*); 1♂ (*Boettger*). 1♂ (*Le Moul*).

Depositories: BMNH, USNM.

### The *asmura* group

The *asmura* group is distinguished by a short extension of the hind wing at the distal end of vein M<sub>3</sub>, terminating in a tuft of scales projecting beyond the fringe, and by the distinctive, large transtillae in the male genitalia.

#### *Oospila asmura* (Druce)

(Figs 17, 93, 156)

*Racheospila* (?) *asmura* Druce, 1892: 92. Holotype ♂, in MNHU. Type locality: PANAMA. Label data: 715; Origin; Zool. Mus[eum] Berlin; Chiriqui; Typus; *Racheospila asmura* ♂ type Druce. [Examined.]

*Drucia asmura* (Druce); Warren, 1900: 133.

*Oospila asmura* (Druce); Prout, 1912: 133; 1933: 59.

*Drucia latimargo* Warren, 1904a: 20. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; S[anto] Domingo, Carabaya, 6000 ft, XII.01. wet seas[on] (Ockenden); *Oospila latimargo* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15730 ♂. [Examined.] **Syn.n.**

*Oospila latimargo* (Warren); Prout, 1912: 133; 1932: 59.

*Drucia fumidimargo* Dognin, 1911b: 162. Holotype ♂, in USNM. Type locality: COLOMBIA. Colombia: [Valle.] near Cali, Alto de las Cruces, 2200 m, iii.1909 (*Fassl*). [Examined.] **Syn.n.**

*Oospila fumidimargo* (Dognin); Prout, 1912: 134; 1933: 59.

♂, ♀ (Fig. 17). Fore wing length 10–16 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet brown. Thorax: dor-



sal surface dark green. Wings: ground colour dark green, markings reddish brown. Fore wing: costa pale brown; blotch at apex large, usually connected by narrow band along termen to blotch at tornus; discal spot small, brown. Hind wing: blotch at apex large, connected by narrow band along termen to blotch at tornus; blotch at tornus smaller, connected to blotch at anal margin by narrow band along anal margin; blotch at anal margin small, narrow; discal spot small, brown; usually with short extension of wing at distal end of vein  $M_3$ , marked by one or two tufts of dark brown scales projecting beyond wing fringe. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface reddish brown; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 with posterior edge emarginated in male.

**GENITALIA** ♂ (Fig. 93). Uncus not extended. Socii small. Gnathos: not fused, not reduced. Valva: apex rounded; ampulla absent; sacculus not extended. Transtillae in form of massive curved projections, not fused to each other, membranous in smaller specimens, strongly sclerotized and with denticulate apex in larger specimens (as in Fig. 93). Anellar complex: V-shaped. Vinculum: ventral plate formed by two strongly sclerotized rods, joined by more weakly sclerotized plate. Aedeagus: vesica with small cornutus.

**GENITALIA** ♀ (Fig. 156). Ostium: surrounded by weakly sclerotized convoluted folds; sterigma absent. Bursa copulatrix: ductus bursae short, strongly sclerotized but not striated; antrum indistinct; corpus bursae approximately spherical; signum small. Anterior apophyses short.

**DIAGNOSIS.** *Oospila asmura* is similar to *camilla* in external appearance, but can be distinguished by the absence of a green patch enclosed within the red-brown markings of the fore wings (compare Figs 17 and 21). The female genitalia of these two species can be distinguished by the absence of a pocket posterior of the ostium in *asmura* (compare Figs 156 and 158).

*Oospila asmura* can be distinguished from *circumsessa* by the separation of the blotches at the apex and the tornus of the fore wings; by the absence of small yellow markings within the brown markings of the hind wings; and by the extension, along the anal margin of the hind wings, of the blotch at the tornus (compare Figs 17 and 18). The male genitalia of *asmura* and

*circumsessa* are quite similar, but the sacculus of the valva of *asmura* is not extended, whereas it is in *circumsessa* (compare Figs 93 and 94).

The extension of the blotch at the tornus of the hind wing along the anal margin, and the extension of the hind wing at the apex of vein  $M_3$  distinguish *asmura* from *jaspidata* (compare Figs 17 and 65).

The male genitalia of *asmura* are distinguished from those of *rosipara* and *delphinata* by the absence of small spines at the tip of the valvae (compare Figs 93 and 95). These three species also have distinctive wing markings (compare Figs 17, 19 and 20). The female genitalia of *asmura* can be distinguished from those of *delphinata* and *rosipara* by the absence of striation of the ductus bursae in *asmura* (compare Figs 156 and 157).

**DISTRIBUTION.** Widely distributed in Central and South America.

**MATERIAL EXAMINED.** **Guatemala:** *Quezaltenango:* Volcan Santa Maria, 1♂. *Acatenango,* *Quisache:* Chimaltenango, 1750 m, 1♂, 10.x.1966 (Welling). **Costa Rica:** *Cartago:* Cachi, 1 ♀. Moravia de Chirripo, 1000 m, 1 ♀, 10.v.1983 (Janzen, Hallwachs); Juan Vinas, 760 m, 1♂, v. (Schaus); 2♂, 3♀; Orosi, 1200 m, 2 ♂ (Fassl); Sitio, 1♂. *Puntarenas:* Monteverde, 1♂, 1♀ (Covell); 35 km NE San Vito, near Las Alturas, Las Alturas Field Station, 1400 m, 1♂, 22.iii.1991 (Miller); 35 km NE of San Vito, Las Alturas Field Station, 1♀, 29.v.1992, 1♀, 20.vi.1992 (Snyder); 1♀. **Panama:** *Chiriqui:* Bogava, Chiriqui, 240 m, 1♀ (Watson); Chiriqui, 1♂ [holotype of *asmura*]; Volcan, 1♀, vii.1981 (Kraus). **French Guiana:** *Guyane:* St. Laurent du Maroni, 1♂. **Venezuela:** *Aragua:* Rancho Grande, 1100 m, Parque Nacional Henri Pittier, 1♂, 25.vi.74 (Pilske); 1♀. *Lara:* Yacambu National Park, 13 km South East Sanare, 1500 m, 3♂. **Colombia:** *Meta:* East Colombia: Upper Rio Negro, 800 m, 4♂ (Fassl). *Tolima:* Rio Toche, Quindiu, 2400 m, 1♂; 4♂. *Valle:* Near Cali, Alto de las Cruces, 2200 m, 1♂ [holotype of *fumidimargo*] iii.1909 (Fassl). **Ecuador:** 1♂, 1920 (Hammond). *Bolivar:* Balzapamba, 1♀, ix.1883–ii.1884 (Mathan). *Chimborazo:* Huigra, 1♀. *Loja:* Environs de la Loja, 1♂, 1891; 2♂, 1 ?; Loja, 1♂. *Morona-Santiago:* Sevilla Don Bosco, 1070 m, 1♂, 8–11.v.1986 (McKamey). **Peru:** 1♂ (Mathan); Rio Bamba, Hacienda Cayandedel, Versant Quest Cordillieres, 1300 m, 1♂, 1♀, ii.1883 (Stolzmann). *Amazonas:* Chachapoyas, 15♂, 1889 (Mathan); Huambo, 1♂, 1889 (Mathan). *Cajamarca:* Huancabamba,

Cerro de Paseo, 2–300 m, 1♂ (*Boettger*); Huanabamba, Cerro de Paseo, 2 ♂ (*Boettger*). **Cuzco**: Caradoc, Marcapata, 1200 m, 1♀, ii.01 (*Ockenden*); Cuzco, 1♂, ii.1952 (*Waylkowski*). **Huanuco**: Pozuzo, 1500–1800 m, 1♂ (*Native collector*). **Puno**: La Oroya, Rio Inambari, 940 m, 1♂, dry season, ix.04 (*Ockenden*); 1♂, wet season, ix.04 (*Ockenden*); 1♂, 1♀, wet season, iii.05 (*Ockenden*); 1♀, ix.05 (*Ockenden*); 1♂, wet season, xi–xi.1905 (*Ockenden*); 1♀, wet season, xii.05 (*Ockenden*). **La Union**, Rio Huacamay, 610 m, 2♂, wet season, xi.04 (*Ockenden*); 1♂, wet season, xii.1904 (*Ockenden*). **Oconeque**, 2100 m, 1♀, dry season, vii.1904 (*Ockenden*). **Santo Domingo**, 1800 m, 1♂ [holotype of *latimargo*] wet season, xii.01 (*Ockenden*); 1♂, xi.1904 (*Ockenden*); **Tinguri**, 1000 m, 5♂, dry season, viii.1904 (*Ockenden*). **Bolivia**: **Cochabamba**: Charaplaya, 65°W 16°S, 1300 m, 1♂, vi.01 (*Simons*); Yungas del Espiritu Santo, 11♂, 1888–1889 (*Germain*); Incachaca, 1♀. **La Paz**: Balzapamba, 2♂, 1♀; Rio Songo, 750 m, 1♂; Rio Songo, 1400 m, 1♂, 24–30.x.1984 (*Pena*). **Sud Yugas**: Puente Villa, 1♂ (*Covell*). **River Tamampaya**, 1♂ (*Garlepp*); 3♂ (*Germain*). **Argentina**: **Jujuy**: Parque Nacional Calilegua, 4.5 km along Rt.83, 800 m, 1♂, 5.iv.1992 (*DeVries, Di Iorio, Quinter, Yeates*); Parque Nacional Calilegua (near entrance), Rt.83, along Rio San Lorenzo, 575m, 1♂, iii.iv.1992 (*DeVries, Di Iorio, Quinter, Yeates*); 7.6 km from Rt.9 along Leon to Tiraxi road, 1650 m, 1♂, 9.11.iv.1992 (*DeVries, Di Iorio, Quinter, Yeates*); Rt.83 near entrance Parque Nacional Calilegua along Rio San Lorenzo, 575m, 1♀, 31.iii.–3.iv.1992 (*De Vries, Di Iorio, Quinter, Yeates*); Parque Nacional Calilegua, 4.5 km along Rt.83, 800 m, 1♀, 5.iv.1992 (*De Vries, Di Iorio, Quinter, Yeates*).

**Depositories**: AMNH, BMNH, CMNH, CVCJ, INBio, MNHU, USNM.

### *Oospila circumssessa* Prout

(Figs 18, 94)

*Oospila circumssessa* Prout, 1918a: 119; 1933: 59. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; Contamana Rio Ucayali, Peru, Nov[ember]–Dec[ember] 1912; *Oospila circumssessa* ♂ type Prout; Joicey Bequest. Brit[ish] Mus[eu]m 1934–120. [Examined.]

♂ (Fig. 18). Fore wing length 10 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; red-brown band along termen,

not extending along costa, widest at tornus, yellowish towards termen; discal spot small, brown. Hind wing: blotches at apex and tornus joined by narrow band along termen, with small yellow patch 1/3 along termen; blotch at anal margin absent; discal spot small, brown; wings with short extension at angle, marked by small tuft of dark scales projecting beyond fringe. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; posterior margin of sternum A8 emarginated.

**GENITALIA** ♂ (Fig. 94). Uncus short, not extended. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla absent; sacculus extended to short, robust apical process. Transillae: large outwardly curving, weakly sclerotized lobes with pointed tips. Anellar complex: V-shaped; incompletely surrounding aedeagus. Vinculum: ventral plate broad, W-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀. Unknown.

**DIAGNOSIS.** *Oospila circumssessa* may be distinguished from *asmura* and *jaspidata* by the merging of the blotches on the fore wings, and by the presence of small yellow markings within the brown markings of the hind wings (compare Figs 17, 18 and 65). The male genitalia of *circumssessa* and *asmura* are quite similar, but the sacculus of *asmura* is not extended as it is in *circumssessa* (compare Figs 93 and 94).

**DISTRIBUTION.** Only two males were examined, both from the Loreto region of Peru.

**MATERIAL EXAMINED.** **Peru**: **Loreto**: Contamana, Rio Ucayali, 1♂ [holotype] xi–xii.1912; Pumayacu, 1♂.

**Depositories**: BMNH, USNM.

### *Oospila rosipara* (Warren)

(Figs 19, 95, 157)

*Racheospila rosipara* Warren, 1897: 431. Holotype ♂, in BMNH. Type locality: VENEZUELA. Label data: Type; Palma Sola, Venezuela; *Racheolopha*; *Racheospila rosipara* type ♂ Warr[en]; *Racheolopha*; Rothschild Bequest B[ritish] M[useum] 1939–1; Geometridae genitalia slide No. 15040 ♂. [Examined.]



*Oospila rosipara* (Warren); Prout, 1912: 133; 1933: 57.

*Racheolopha flavicincta* Warren, 1900: 137. Holotype ♀, in BMNH. Type locality: VENEZUELA. Label data: Type; Palma Sola, Venezuela; Rothschild Bequest B[ritish] M[useum] 1939-I; *Racheolopha flavicincta* type ♀ Warren; Geometridae genitalia slide No. 15039 ♀. [Examined.] **Syn.n.**

*Oospila flavicincta* (Warren); Prout, 1933: 57.

*Racheolopha microspila* Warren, 1909: 86. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Union, R[io] Huacamay, Carabaya, 200 ft, wet season, Dec[ember] 1904. (G. Ockenden); *Racheolopha microspila* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15041 ♂. [Examined.] **Syn.n.**

*Oospila microspila* (Warren); Prout, 1933: 57.

*Racheolopha conversa* Dognin, 1908: 264. Holotype ♀, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: S[ain]t Laurent du Maroni. [Examined.] Synonymized by Prout, 1932: 57.

*Oospila conversa* (Dognin); Prout, 1912: 134.

[*Oospila rosipara* ab. *conversa* Prout, 1933: 57.

Infra-subspecific name.]

♂, ♀ (Fig. 19). Fore wing length 12–18 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet brown. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings dark brown, or pale brown with darker perimeters. Fore wing: costa pale brown; blotch at apex large; blotch at tornus absent; discal spot small, brown. Hind wing: blotch at apex large; blotch at tornus absent; blotch at anal margin large, narrow; discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown or green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 posterior edge emarginated in male.

**GENITALIA** ♂ (Fig. 95). Uncus reduced to broad bar. Socii small, narrow. Gnathos: not fused, not reduced. Valva: narrows markedly towards spinose apex; ampulla absent; sacculus not extended. Transtillae: large outwardly curving, weakly or strongly sclerotized lobes, denticulate in larger specimens, not denticulate in smaller specimens. Anellar complex: reduced to V-shaped juxta. Vinculum: ventral plate broad,

weakly emarginated. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 157). Ostium: sterigma absent. Bursa copulatrix: ductus bursae short, strongly sclerotized, striated, antrum indistinct; corpus bursae quite small; signum small. Anterior apophyses short.

**DIAGNOSIS.** The large blotches at the apex of the fore and hind wings and the absence of blotches at the tornus of the wings distinguishes *rosipara* from other *Oospila* with blotches on the wings. The male and female genitalia are indistinguishable from those of *delphinata* (Figs 95, 157).

**DISTRIBUTION.** This species is widely distributed in Central and South America.

**MATERIAL EXAMINED.** **Guatemala:** *Izabel:* Cayuga, 4♂, 1♀; 1♀, v. (*Schaus, Barnes*). **Costa Rica:** *Limon:* Guapiles, 1♂; Sixaola River, 1♂; 1♂, iii. *Osa Peninsula:* Sirena, Corcovado National Park, 2♂, 11.i.1981 (*Janzen, Hallwachs*). *Cartago:* Turrialba, 1♀, 30.v.1962 (*Ruckes*). **Panama:** La Choerra, 1♀. **French Guiana:** *Guyane:* St. Jean du Maroni, 4♂, iii. (*Le Moul*); Nouveau Chantier, 1♂, iii. (*Le Moul*); 1♂, vii (*Le Moul*); Cayenne, 1♂; St. Laurent du Maroni, 1♂, 1♀ [holotype of *conversa*]; 2♀. **Venezuela:** Palma Sola, 1♂ [holotype of *rosipara*]; 1♀ [holotype of *flavicincta*]; 1♂; 1♀, vi.1909 (*Klages*). *Aragua:* El Limon, 450 m, 1♀. *Barinas:* Barinas, Rio Caparo Research Station, 32 km East El Canton, 1♂. *Carabobo:* San Esteban, 1♂, 1♀, vi.1909 (*Klages*); Las Quiguas, Esteban Valley, 1♂, 1914; 1♂, 1♀. *Miranda:* Miranda Parque Nacional, Guatopo Agua Blanca, 500 m, 1♀, 7.v.1975. **Colombia:** *Boyaca:* River Cantinero, Muzo, 400 m, 1♂ (*Fassl*). Minca, 610 m, 1♀ (*Smith*); Muzo, 400–800 m, 2 ♂ (*Fassl*). *Cauca:* Popayan, 2♂. *Meta:* Upper Rio Negro, Ost Colombia, 800 m, 1♂ (*Fassl*). **Ecuador:** Bulim, 50 m, 1♀, xii.00 (*Fl., M.*). *Loja, Santiago-Zamora:* Cumbaratza, SE Loja, 1♂, 3–4.iv.1965 (*Pena*). **Peru:** *Huanuco:* Tingo Maria, 1♂. *Junin:* Lima-Charchamayo, 1♂ (*Moss*); La Merced, 910–1400 m, 1♂, i–ii.20 (*Watkins*). *Cuzco:* Quincemil, 730 m, 1♂, vii.1962 (*Pena*). *Puno:* La Union, Rio Huacamay, Carabaya, 60 m, 1♂ [holotype of *microspila*] wet season, xii.1904 (*Ockenden*). **Brazil:** *Amazonas:* Sao Paulo de Olivença, 1♂; Hyntanahan, Rio Purus, 1♂, ii.1922 (*Klages*); Fonte Boa, 1♂, vi.1906 (*Klages*). *Para:* Unt. Amaz. Taperinha, below Santarem, 1♂, 1–10.vii.27 (*Zerny*).

*Depositories:* AMNH, BMNH, CMNH, INBio, USNM, UCMV.

### *Oospila delphinata* (Warren)

(Figs 20, 95, 157)

*Drucia delphinata* Warren, 1900: 133. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Sao Paulo, *Drucia delphinata* type ♂ Warr[en]; Type; Geometridae genitalia slide No. 15728 ♂. [Examined.]

*Oospila delphinata* (Warren); Prout, 1912: 133; 1933: 59.

*Racheolopha plurimaculata* Warren, 1907: 208. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; Pozuzo, Huánuco, 800–1000 m. (W. Hoffmann); *Racheolopha plurimaculata* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15727 ♂. [Examined.] **Syn.n.**

*Oospila plurimaculata* (Warren); Prout, 1912: 134; 1933: 59.

*Oospila plurimaculata symmicta* Prout, 1933: 59. Holotype ♂, depository unknown. Type locality: BRAZIL. Label data: Brazil: Minas Geraes, 4.ii (coll[ection] Seitz). [Not examined.] **Syn.n.**

*Racheospila heteromorpha* Warren, 1909: 84. LECTOTYPE ♂, here designated, in BMNH. Type locality: PARAGUAY. Label data: Type; Sapucay, Paraguay, 16.x.01. (W. Foster); *Racheolopha heteromorpha* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15729 ♂. [Examined.] **Syn.n.**

*Oospila heteromorpha* (Warren); Prout, 1912: 134.

*Oospila delphinata heteromorpha* (Warren); Prout, 1933: 59.

♂, ♀ (Fig. 20). Fore wing length 9–13 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream or pale brown, irrorated with dark brown and with dark brown perimeters. Fore wing: costa pale brown; blotch at apex small (very small in form *plurimaculata symmicta*; Prout, 1933) not extending to costa, connected to blotch at tornus by barely visible dark line along termen; blotch at tornus small; discal spot small, brown. Hind wing: usually slightly produced at angle, often with tuft of long brown scales marking extension; blotch at apex large, extending half length of termen, connected to blotch at tornus by dark line along termen; blotch at tornus small, connected to blotch at

anal margin by dark line. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface dark brown or green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 emarginated posteriorly in male.

GENITALIA ♂ (Fig. 95). As for *rosipara*.

GENITALIA ♀ (Fig. 157). As for *rosipara*.

DIAGNOSIS. The blotches of *delphinata* are smaller, and paler than in *rosipara* (compare Figs 19 and 20) and the hind wings of *delphinata* have a blotch at the tornus and a short extension at the apex of vein M<sub>3</sub>.

DISTRIBUTION. Unlike *rosipara*, this species does not occur in Central America, but specimens have been collected in Colombia, Ecuador, Peru, Bolivia, Paraguay, Brazil and Argentina.

REMARK. The synonymy of *Oospila plurimaculata symmicta* is based on the description and illustration of Prout (1933: 59, Pl. 7. Fig. h). Attempts to trace the type have proved unsuccessful.

MATERIAL EXAMINED. **Colombia:** *Cundinamarca:* Mediana, 1♂. **Ecuador:** *Pastaza:* Huigra, 2100 m, 1♂, 3.vi.1931 (Coxey). **Peru:** *Huanuco:* Pozuzo, Huanuco, 800–1000 m, 1♂ [holotype of *plurimaculata*] (Hoffmann); **Peru:** *Junin:* 1000 m, San Ramon, Estancia Naranjal, 1♂, 20–27.vii.1965 (Wygodzinsky). **Bolivia:** *Santa Cruz:* Central Bolivia: Santa Cruz de la Sierra, 450 m, 1♂, ix.1909 (Steinbach). **Paraguay:** Itape, 1♂, 27.xi.24 (Schade). **Paraguari:** Sapucay: 1♂ [lectotype of *heteromorpha*] 16.x.01 (Foster); 1♂ [paralectotype of *heteromorpha*] 16.x.04 (Foster); 1♀ [paralectotype of *delphinata heteromorpha*] x.04 (Foster); 1♂ (Foster). **Brazil:** Serra de Baturlite, Ceara, 1♂, i.1985 (Gounelle). Rio Grande do Sul, 1♂. **Minas Geraes:** 1♂; 1♀ (*Le Mout*). **Mato Grosso:** Burity, Mato Grosso, 20 miles North East of Cuyaba, 690 m, 1♂, 6–21.ix.27 (Collenette); Chapada, near Cuyaba, Mato Grosso, 4♂ (Smith). **Para:** Unt. Amaz. Taperinha, below Santarem, 1♂, 10.vii.27 (Zerny). **Parana:** Castro, 890 m, 1♂ (Jones). Iguassu, 1♂, 1?, xi.1922. **Rio de Janeiro:** Itatiaia, 700 m, Estado do Rio Brasil, 1♂; Nova Friburgo, 1♀. **Santa Catarina:** Santa Catarina, Nova Bremen, Rio Laeiss, 1♂, iv.1936 (Hoffmann); Rio Laeiss, Blumenau 2♂, x.1934 (Hoffmann); Blumenau, 2♂, 29.iv.29 (Schade);



Jaragua do Sul, 1♂, xi.27 (*Hoffmann*); Hansa Humbolt, 60 m, 1♂, vii.1936 (*Maller*); Rio Natal, vic. Sao Beuto do Sul, 1♂, 15.viii.1985 (*Mielke, Casegrande*). **Sao Paulo:** South East Brazil, Sao Paulo, 1♂ [holotype of *delphinata*]; 3♂, 1♀; 700 m, 2 ♂ (*Jones*). **Argentina:** Jujuy: Rt.83, near entrance Parque Nacional Calilegua along Rio San Lorenzo, 1♂, 31.iii–3.iv.1992 (*DeVries, Di Iorio, Quinter, Yeates*); Ledesma, 5.5–7.5 km W of Rt. 34 near entrance Parque Nacional Calilegua, 1600 m, 2♂, 14.ii.1991, mesic forest along river (*Johnson et al.*).

**Depositories:** AMNH, BMNH, CMNH, CVCJ, USNM.

### *Oospila camilla* Schaus

(Pl. 1: 5, Figs 21, 96, 158)

*Oospila camilla* Schaus, 1913: 350; Prout, 1933: 58. Holotype ♀, in USNM. Type locality: COSTA RICA. Label data: March; Sixaola Riv[er] C[osta] R[ica]; *Oospila*; Type No. 17979 U.S.N.M.; *Oospila camilla* type Sch[au]s; Genitalia Slide By MAC 57759 USNM. [Examined.]

♂, ♀ (Pl. 1: 5; Fig. 21). Fore wing length 11–12 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; very broad red-brown band along termen interrupted in unique male specimen by small subapical green patch and two yellow spots halfway along termen; discal spot small, red-brown. Hind wing: broad red-brown band along termen, extended along anal margin as a narrow band, then expanding at wing base; discal spot red-brown; wing slightly produced at angle. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown or cream; sternum A2 of male lacking brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane between A2 and A3 of male; sternum A8 of male not strongly sclerotized, simple.

**GENITALIA** ♂ (Fig. 96). Uncus long, slightly expanded at apex. Socii large. Gnathos fused, with long medial projection. Valva: ampulla distinctive (Fig. 96); sacculus not extended. Anellar complex: distinctive (Fig. 96); posterior extensions fused to dorsal area of valvae and anterior extensions fused to ventral area. Vinculum: ventral plate broad, with medial projection Core-

mata present. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 158). Ostium: with small pocket posteriorly; sterigma ring-shaped. Bursa copulatrix: ductus bursae reduced, neither strongly sclerotized nor striated, antrum absent; corpus bursae quite small; signum small. Anterior apophyses short.

**DIAGNOSIS.** The wing markings of *camilla* are similar to those of *asmura*, but in *camilla* the red-brown markings of the wings are broader. The male genitalia can be recognised by the form of the ampullae and of the anellar complex (Fig. 96). The female genitalia can be recognised by the presence of a pocket posterior to the ostium (Fig. 158).

**DISTRIBUTION.** Known only from Limon Province in Costa Rica.

**MATERIAL EXAMINED.** **Costa Rica:** Limon: Sixaola River, 1♀ [holotype] iii. [no year]; Cerro Tortuguero, Parque Nacional Tortuguero, 100 m, 1♂, 1♀, v.1989 (*Aguillar, Solano*).

**Depositories:** INBio, USNM.

### The *astigma* group

In the *astigma* group vein R<sub>1</sub> arises distad of the origin of vein M<sub>1</sub> in the fore wing. Although the species included are rather similar in external appearance, they can often be distinguished by their wing markings. However, some intraspecific variation in wing pattern may cause confusion. The genitalia are distinctive.

### *Oospila astigma* (Warren) **comb.n.**

(Pl. 1: 6, Figs 22, 97)

*Racheolopha astigma* Warren, 1907: 206. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Oroya, R[io] Inambari, S[outh] E[ast] Peru 3100 ft, wet s[eason], Oct[ober] 1904 (G. Ockenden); Rothschild Bequest B[ritish] M[useum] 1939–I; *Racheolopha astigma* type ♂ Warr[en]; Geometridae genitalia slide No. 15798 ♂. [Examined.]

*Auophyllodes astigma* (Warren); Prout, 1912: 131.

*Racheolopha astigma* (Warren); Prout, 1932: 54.

♂ (Pl. 1: 6, Fig. 22). Fore wing length 9–11 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream irrorated with brown, usually with inconspicuous dark brown perimeters. Fore wing: costa pale

brown; brown line along termen; discal spot absent. Hind wing: with similar line along termen; discal spot absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male emarginated posteriorly.

GENITALIA ♂ (Fig. 97). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla absent; short projection from base of valva (arrowed in Fig. 97); sacculus extended, but not pointed. Anellar complex: completely surrounding aedeagus, not fused to valvae; with two posterior processes. Vinculum: ventral plate emarginated. Aedeagus: denticulate at base; vesica lacking prominent cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. The wing markings of *astigma* (Pl. 1: 6 and Fig. 22) are similar to those of *albipunctulata*, *delacruzi* and *leucostigma* (Figs 23, 24, 25) but *astigma* lacks discal spots. *O. astigma* can be distinguished from *miccularia* by the paler colour of the markings and by the shape of the blotch at the apex of the fore wing (compare Pl. 1: 6, Figs 22 and 30). The male genitalia of *astigma* can be recognised by the form of the anellar complex; the small, pointed extension of the base of the valva; and the denticulate aedeagus.

DISTRIBUTION. Known only from Colombia and Peru.

MATERIAL EXAMINED. **Colombia:** *Meta*: East Colombia, Upper Rio Negro, 800 m, 9♂ (*Fassl*). **Peru:** *Puno*: La Oroya, Rio Inambari, 940 m, 1♂ [holotype] wet season, x.1904 (*Ockenden*); 1♂, wet season, ix.05 (*Ockenden*); 1♂, wet season, xii.05 (*Ockenden*); La Union, Rio Huacamayo, Carabaya, 610 m, 1♂, xi.1904 (*Ockenden*); Oconeque, Carabaya, 2100 m, 1♂, dry season, vi.1904 (*Ockenden*); Tinguri, Carabaya, 1000 m, 2♂, dry season, viii.1904 (*Ockenden*); 1♂ [paratype] wet season, i.05 (*Ockenden*).

*Depository*: BMNH.

### *Oospila leucostigma* (Warren) **comb.n.**

(Figs 23, 98)

*Racheolopha leucostigma* Warren, 1907: 207; Prout, 1932: 54. LECTOTYPE ♂, here designated, in BMNH. Type locality: PERU. Label data: Type; Tinguri, Carabaya, 3400 ft, wet

s[eason], Jan[uary] 1905. (G. Ockenden); Rothschild Bequest B[ritish] M[useum] 1939-l; *Racheolopha leucostigma* type ♂ Warr[en]; Geometridae genitalia slide No. 15799 ♂. [Examined.]

*Auophyllodes leucostigma* (Warren); Prout, 1912: 131.

♂ (Fig. 23). Fore wing length 8–10 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream. Fore wing: costa pale brown; subapical blotch triangular, sometimes connected to blotch at tornus by line along termen; discal spot small, brown and inconspicuous. Hind wing: blotch at apex large, connected to blotch at tornus; blotch at tornus not large; discal spot white. Hind leg: proximal spurs absent; with brush of long hair-like scales on tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 emarginated posteriorly.

GENITALIA ♂ (Fig. 98). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: costa more strongly sclerotized towards apex; ampulla short, narrow, curved; sacculus developed, emarginated. Anellar complex: completely surrounding aedeagus, approximately square in profile. Coremata absent. Vinculum: ventral plate usually V-shaped, sometimes emarginated. Aedeagus with large carina; vesica with large cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. The cream wing markings of *leucostigma* are usually larger than those of *delacruzi* (compare Figs 23 and 24), and in many specimens of *delacruzi* the wings lack these markings entirely. However, intraspecific variation does occur in the extent of the markings in both species, so such patterns may be insufficient to identify the species. The presence of a small, white discal spot on the hind wing of *leucostigma* distinguishes it from *astigma*. *Oospila leucostigma* can be distinguished from *albipunctulata* and *miccularia* by the apical blotch of the fore wing, which does not extend to the costa in *leucostigma* (compare Pl. 1: 6, Figs 23, 25 and 30). The wing markings of *leucostigma* are also paler than those of *miccularia*. Males of *leucostigma* can be distinguished from all these species by the presence of a brush of long hair-like scales on the hind tibia. The male genitalia of



*leucostigma* can be recognised by the shape of the ampulla and the anellar complex (Fig. 98).

**DISTRIBUTION.** Known only from Ecuador, Colombia and Peru.

**MATERIAL EXAMINED.** **Ecuador:** *Tungurahua:* Or de Banosa Canelos, 1♂, ix–x.1984 (*Mathan*). **Colombia:** *Meta:* Upper Rio Negro, 800 m, 3♂ (*Fassl*). **Peru:** *Puno:* Tinguri, Carabaya, 1000 m, 2♂, dry season, viii.1904 (*Ockenden*); 1♂ [lectotype] wet season, i.1905 (*Ockenden*); 1♂ [paralectotype] wet season, i.1905 (*Ockenden*); La Oroya, Rio Inambari, 940 m, 1♂, dry season, viii.1904 (*Ockenden*); 1♂ [paralectotype] wet season, iii.1905 (*Ockenden*); 1♂, ix.05 (*Ockenden*); 1♂, wet season, xi–xii.1905 (*Ockenden*); 1♂, wet season, i.1906 (*Ockenden*). South East Peru, 1♂.

*Depository:* BMNH.

### *Oospila delacruz* (Dognin)

(Figs 24, 76, 99, 159)

*Comibaena delacruz* Dognin, 1898: 218. Holotype ♂, in USNM. Type locality: ECUADOR. Label data: Environs de Loja Equateur 1890; Dognin Collection; *Comibaena Delacruz* type ♂ D[o]g[ni]n; close to *Comibaena callicula* Druce pl 49 fig 19 [page] 88; [?] de *Comibaena invasata* W[a]l[k[er]] [*Biologia centrali-Americana*] 49 fig 18; Type No. 32757 U.S.N.M.; Genitalia slide No. MAC 022. [Examined.]

*Oospila delacruz* (Dognin); Warren, 1904b: 505. *Auophyllodes delacruz* (Dognin); Prout, 1912: 131.

[*Racheolopha delacruzei* (Dognin); Prout, 1932: 54. Incorrect spelling of *delacruz*.]

*Oospila restricta* Warren, 1904b: 504; Prout, 1912: 133. Holotype ♀, in BMNH. Type locality: PERU. Label data: Type; S[anto] Domingo, Carabaya, 6500 ft. Dec[ember] 02. Wet s[eason] (G. Ockenden); *Oospila restricta* type ♀ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15801 ♀. [Examined.] **Syn.n.** *Racheolopha restricta* (Warren); Prout, 1932: 54.

♂, ♀ (Fig. 24, 76). Fore wing length 8–11 mm. Antenna of female unknown. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches present or absent; where present, cream, with dark brown speckling. Fore wing: subapical blotch when present usually small, never extending to costa, sometimes connected to blotch at tornus by line along termen; blotch at

tornus small, sometimes absent; discal spot small, brown. Hind wing: blotch at apex absent or large and sometimes connected to blotch at tornus by line along termen; wings often unmarked except for brown band along termen; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream or brown; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male emarginated posteriorly.

**GENITALIA** ♂ (Fig. 99). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla absent; sacculus pointed; additional rounded lobe also present. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate not emarginated. Coremata absent. Aedeagus with short carinate process; vesica lacking cornuti.

**GENITALIA** ♀ (Fig. 159). Sterigma absent. Bursa copulatrix: ductus bursae long, narrow, with long antrum, strongly sclerotized and striated below antrum; corpus bursae quite large, signum large. Anterior apophyses very short.

**DIAGNOSIS.** Although the wing markings of *delacruz* are usually less extensive than those of *leucostigma* (compare Figs 23 and 24) intraspecific variation in both species means that this character is not always reliable. Males can be distinguished effectively by the absence of a brush of long hair-like scales on the hind tibia of *delacruz*. *O. delacruz* has a white discal spot on the hind wing, which is lacking in *astigma* (compare Pl. 1: 6, Fig 22 and 24). When present, the cream wing markings of *Oospila delacruz* differ from those of *albipunctulata* (compare Figs 24 and 25): if present, the subapical blotch on the fore wing of *delacruz* never extends to the costa, as it does in *albipunctulata*.

The male genitalia of *delacruz* can be recognised by the shape of the valvae and shape of the anellar complex (Fig. 99).

**DISTRIBUTION.** Material was examined from Colombia, Ecuador and Peru.

**MATERIAL EXAMINED.** **Colombia:** *Meta:* East Colombia, Upper Rio Negro, 800 m, 1♂, 1 ♀ (*Fassl*). **Ecuador:** Environs de Loja, 1♂ [holotype of *delacruz*] 1890. **Peru:** *Puno:* La Oroya, Rio Inambari, 940 m, 2♂, wet season, xii.05 (*Ockenden*); Tinguri, Carabaya, 1000 m, 4♂, 1♀, dry season, viii.1904 (*Ockenden*); 1♂, i.1905; Santo Domingo, Carabaya, 1800 m, 1♀,

iv.02 (*Ockenden*); 1♂, dry season, vi.02 (*Ockenden*); 1♀ [holotype of *restricta*] xii.02 (*Ockenden*); Oconeque, Carabaya, 2100 m, 2♂, dry season, vii.1904 (*Ockenden*).

Depository: BMNH.

***Oospila albipunctulata* (Prout) comb.n.**

(Figs 25, 100, 160)

*Racheolopha albipunctulata* Prout, 1932: 54. Holotype ♂, in BMNH. Type locality: COLOMBIA. Label data: Type; Muzo. Colombia 400–800 m Coll[ection] Fassl; Seitz VIII p54 (1932); *Racheolopha albipunctulata* ♂ type Prout; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15797 ♂. [Examined.]

♂, ♀ (Fig. 25). Fore wing length 7–9 mm. Antenna of female unknown. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream, irrorated with brown, and with inconspicuous dark brown perimeters. Fore wing: costa pale brown; blotch at apex extending to costa and connected to blotch at tornus by narrow band along termen; blotch at tornus small; discal spot absent. Hind wing: blotch at apex extending half length of termen, connected to blotch at tornus by narrow band along termen; blotch at anal margin absent; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream, with pink and brown flecks; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male emarginated posteriorly.

GENITALIA ♂ (Fig. 100). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla absent; sacculus extended, with pointed apex; additional large digitate process with denticulate apex also present. Anellar complex: not completely surrounding aedeagus. Vinculum: ventral plate emarginated. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀ (Fig. 160). Ostium: sterigma absent. Bursa copulatrix: ductus bursae short, narrow, antrum large; corpus bursae large; signum elongated. Anterior apophyses very short.

DIAGNOSIS. The wing markings of *albipunctulata* are similar to those of *astigma*, *delacruzii*,

*leucostigma* and *miccularia*, and intraspecific variation within these species is such that examination of the genitalia is desirable to confirm identification. *Oospila albipunctulata* bears a small white discal spot on the hind wing, while in *astigma* the discal spot is lacking and in *miccularia* the spot is lacking or small and reddish. The markings of *albipunctulata* are also paler than those of *miccularia*. The greater extent of the cream markings in *albipunctulata* distinguishes it from *delacruzii* (compare Figs 24 and 25). *Oospila albipunctulata* can be distinguished from *leucostigma* by the extent of the apical blotch of the fore wing (compare Figs 23 and 25).

The male genitalia of *albipunctulata* can be recognised by shape of the valvae and the arrangement of small spines towards the apex of the valvae (Fig. 100).

DISTRIBUTION. Material was examined from Costa Rica, Panama, Colombia and Peru.

MATERIAL EXAMINED. **Costa Rica:** *Heredia:* Estacion Magasasay, Parque Nacional Braulio Carrillo, 200 m, 1 ♂, spring 1991 (*Fernandez*). **Panama:** *Chiriqui:* 3♂ [paratypes]. **Colombia:** *Boyaca:* Muzo, 400–800 m, 1♂ [holotype] (*Fassl*); 4♂ [paratypes]; 1♂, 1♀. *Meta:* Upper Rio Negro, 800 m, 1♂ (*Fassl*). **Peru:** *Puno:* Rio Huacamayo, Carabaya, 940 m, 1♂, vi.04 (*Ockenden*).

Depository: BMNH.

***Oospila rufilimes* (Warren) comb.n.**

(Figs 26, 101, 161)

*Racheolopha rufilimes* Warren, 1905: 319; Prout, 1912: 129; 1932: 53. Holotype ♀, in BMNH. Type locality: ECUADOR. label data: Type; R[iver] Cayapas, N[orth] W[est] Ecuador (Fl. & Mik.); Rothschild Bequest B[ritish] M[useum] 1939–I; *Racheolopha rufilimes* type ♀ Warr[en]; Geometridae genitalia slide No. 15788 ♀ [Examined.]

*Racheolopha extensata* Warren, 1906: 423. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. French Guiana, Maroni R[iver], S[ain]t Jean, vii. 1904; Schaus Coll[ection]; Type No. 9193 U.S.N.M. [Examined.] **Syn.n.** *Auophyllodes extensata* (Warren); Prout, 1912: 131; 1932: 53.

♂, ♀ (Fig. 26). Fore wing length 7–8 mm. Antenna of female simple. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; blotch at apex long, narrow, con-



nected to blotch at tornus by band along termen; discal spot small, brown. Hind wing: blotch at apex long, narrow, connected to blotch at tornus by band along termen; blotch at tornus extending along 1/3 of costal and anal margins; discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface reddish brown; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male, with bifurcate posterior extension.

**GENITALIA** ♂ (Fig. 101). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: apex cleft; ampulla absent; sacculus extended into robust, strongly sclerotized, apically serrated, process. Anellar complex: not surrounding aedeagus completely; highly distinctive with pair of long processes on each side. Coremata absent. Vinculum: ventral plate weakly emarginated. Aedeagus short, squat; vesica with small cornutus.

**GENITALIA** ♀ (Fig. 161). Ostium: sterigma absent. Bursa copulatrix: ductus bursae wide, with apical part not strongly sclerotized nor striated, antrum absent; ductus more strongly sclerotized towards corpus bursae; corpus bursae large; signum very small, reduced to single tooth. Anterior apophyses short.

**DIAGNOSIS.** Usually *Oospila rufilimes* can be distinguished easily from *arpata* by wing markings (compare Figs 26 and 27). In those specimens in which *arpata* has a small subapical blotch, this never extends to the costa as is the case with *rufilimes*. Females of these species may be distinguished further by the absence of antennal pectinations in *rufilimes*. *O. rufilimes* lacks the distinctive triangular, subapical blotch occurring on the fore wing of *fimbripedata* (compare Pl. 1: 7, Figs 26 and 28). The male genitalia of *rufilimes* can be recognised by the very distinctive form of the anellar complex (Fig. 101).

**DISTRIBUTION.** Specimens were examined from French Guiana, Guyana, Ecuador, Peru and Brazil.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: St. Jean du Maroni, 1♂ [holotype of *extensata*] vii.1904; 8 ♀ (*Le Moult*). **Guyana:** *Mazaruni-Potaro*: Potaro, 1 ♀, ii.1908 (*Klages*). **Ecuador:** North West Ecuador, Cayapas, 1♀ [holotype of *rufilimes*] (*Fl.*, *Mik.*). **BRAZIL:** *Amapa*: Para, 2

♂. *Amazonas*: Fonte Boa, 2♂, v.1906 (*Klages*); Teffe, 1♂, viii.1935 (*Moss*).

*Depository:* BMNH.

### *Oospila arpata* (Schaus) **comb.n.**

(Figs 27, 102, 162)

*Racheospila arpata* Schaus, 1897: 161. Holotype ♀, in USNM. Type locality: BRAZIL. Label data: Rio Janeiro; *Racheospila arpata* Type Sch[au]s; Type No. 11898 U.S.N.M.; Collection Wm Schaus; Genitalia Slide No. MAC 016. [Examined.]

*Auophyllodes arpata* (Schaus); Prout, 1912: 131.

*Racheolopha arpata* (Schaus); Prout, 1932: 54.

*Racheolopha similiplaga* Warren, 1900: 137, LECTOTYPE ♂, here designated, in BMNH. Type locality: unknown. Label data: Type; *Racheolopha similiplaga* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15792 ♂. [Examined.] Synonymized with *Racheolopha arpata* by Prout, 1932: 54.

*Auophyllodes similiplaga* (Warren); Prout, 1912: 131.

*Racheolopha mionophragma* Prout, 1932: 53. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; Pérou Huambo; M. de Mathan IV<sup>e</sup> Trim[estre] 1889; Ex Oberthür Coll[ection] Brit[ish] Mus[eam] 1927-3; *Racheolopha mionophragma* ♂ type Prout; Geometridae genitalia slide No. 15790 ♂. [Examined.] **Syn.n.**

*Racheolopha mionophragma subruta* Prout, 1932: 53. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; Chanchamayo Peru; not matched in coll[ection] D[ogni]n; L. B. Prout Coll[ection] B[ritish] M[useum] 1939-643; Seitz VIII p53; *Racheolopha mionophragma subruta* ♂ type Prout; Geometridae genitalia slide No. 15802 ♂. [Examined.] **Syn.n.**

*Urucumia semicaudata* Prout, 1933: 71 pl 8g. Holotype: ♀, in HECO. Type locality: BRAZIL. Label data: Holotype; Esp[iritu] San[to]; t., 1910, L. B. Prout; 648; blank green label; *Urucumia* (?) *semicaudata* Prout in Seitz VIII; *Auophylla* (?) *semicaudata* Prout type; Type Lep: No 2520 Progonodes *semicaudata* Prout Hope Dept. Oxford. [Examined.] **Syn.n.**

♂, ♀ (Fig. 27). Fore wing length 8-9 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dark green. Wings: dark green with brown marginal markings; discal spots small, brown. Fore wing: usually with a conspicuous, isolated, brown

blotch at angle and sometimes a small subapical blotch; rarely, brown extending along termen towards apex. Hind wing with conspicuous, isolated, brown, apical blotch; rarely brown extending entire length of termen. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male, with deep medial cleft.

**GENITALIA** ♂ (Fig. 102). Uncus a flat bar. Socii not large. Gnathos: not fused, not reduced. Valva: with subapical cleft; ampulla absent; sacculus extended into short, strongly sclerotized, digitate process. Anellar complex: reduced to a V-shaped juxta. Vinculum: ventral plate not emarginated; with short medial projection. Coremata absent. Aedeagus short, squat; vesica lacking cornutus.

**GENITALIA** ♀ (Fig. 162). Ostium: sterigma absent. Bursa copulatrix: ductus bursae strongly sclerotized not striated, antrum indistinct; corpus bursae large, elongated; signum small. Anterior apophyses very short.

**DIAGNOSIS.** In *arpata* the brown wing markings are usually restricted to the tornus of the fore wing and the apex of the hind wing, a pattern differing from that in *rufilimes* in which they extend along the wing margins. Occasionally there is a small subapical blotch in *arpata*, but this never extends to the costa as do the markings in *rufilimes* (compare Figs 26 and 27). Males of *arpata* can be distinguished from those of *rufilimes* by the absence of a bifurcate posterior extension of sternum A8 (compare Figs 101 and 102). Females can be distinguished by the presence of pectinations on the antennae and by the narrower ductus bursae (compare Figs 161 and 162).

*Oospila arpata* can usually be distinguished from *fimbripedata* by the lesser extent of the brown markings (compare Pl. 1: 7, Figs 27 and 28) although in specimens where the markings of *arpata* are more extensive, this character is unreliable. Males of these two species can be distinguished by the different shapes of sternum A8 and, in *arpata*, the absence of an ampulla and the extension of the sacculus (compare Figs 102 and 103).

**DISTRIBUTION.** Material was examined from

Costa Rica, Colombia, Ecuador, Peru, Bolivia and Brazil.

**MATERIAL EXAMINED.** **Costa Rica:** *Alajuela:* Estacion Pitilla, 700 m, 9 km S. Santa Cecilia, 1♂, 1♀, vii.1988 (Scoble, Brooks). *Guanacaste:* 4 km W. Santa Cecilia, 250 m, 1♀, 25.ii.1985 (Janzen, Hallwachs). *Heredia:* La Selva Biol. Sta. 40 m, Puerto Viejo de Sarapiquí, 1♀, iv.1987 (Chavarria). **Colombia:** *Boyaca:* Muzo, 400–800 m, 1♂ (Fassl). *Cauca:* N<sup>elle</sup> Grenade, Juntas, 1♂, end 1897–1898 (Mathan). *Meta:* Upper Rio Negro, 400–800 m, 2 ♂ (Fassl). **Ecuador:** *Pastaza:* El Topo, Rio Pastaza, 1300 m, 1♂ (Palmer). *Canelos* [Riohacha] 640 m, 1♂ (Palmer). **Peru:** *Amazonas:* Huambo, 1♂ [holotype of *mionophragma*] IV<sup>er</sup> Trimestre 1889 (Mathan). *Junin:* Chanchamayo, 1♂ [holotype of *mionophragma subruta*]. La Merced, 610–910 m, 2 ? (Watkins). *Puno:* La Oroya, Rio Inambari, 940 m, 2♂, wet season, iii.05 (Ockenden). La Union, Rio Huacamayo, Carabaya, 610 m, 1♂, 1♀, 1 ?, wet season, xi.1904 (Ockenden). Yahuarmayo, 370 m, 1♂, iv.1912. **Bolivia:** *Cochabamba:* Charaplaya, 65°W 16°S, 1300 m, 1♂, vi.01 (Simons). **Brazil:** Rio Grande du Sol, 1♀. *Parana:* Castro, 890 m, 1 ? (Jones). *Rio de Janeiro:* Rio Janeiro, 1♂ [holotype of *arpata*]; Novo Friburgo, 1♀ [paralectotype of *similiplaga*]. *Sao Paulo:* Alto da Serra, Santos, 800 m, 1♂, 28.ii.1913 (Jones); 1♂, 4.iii.1913 (Jones); 1♂, 5.iv.1913 (Jones). South East Brazil, 1♂. *Sao Paulo*, 1 ?. *Espirito Santo* 1♀ [holotype of *semicaudata*]. **Locality unknown:** 1♂ [lectotype of *similiplaga*].

*Depositories:* BMNH, USNM.

### *Oospila fimbripedata* (Warren) **comb.n.**

(Pl. 1: 7, Figs 28, 103)

*Racheolopha fimbripedata* Warren, 1907: 207; Prout, 1932: 53. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Oroya, R[io] Inambari, S[outh] E[ast] Peru, 3100 ft, wet s[eason], March 05. (G. Ockenden); *Racheospila fimbripedata* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–1; Geometridae genitalia slide No. 15791♂ [Examined.]

*Auophyllodes fimbripedata* (Warren); Prout, 1912: 131.

♂ (Pl. 1: 7, Fig. 28). Fore wing length 9–10 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings brown. Fore wing: costa pale brown; subapical blotch small,



triangular, connected to blotch at tornus by narrow band along termen; blotch at tornus small; discal spot small, brown. Hind wing: blotch at apex connected to blotch at tornus by brown line along termen; blotch at anal margin absent; discal spot small, brown. Hind leg: proximal spurs absent; with brush of long hair-like scales on tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; sternum A2 without brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 strongly sclerotized, deeply emarginated posteriorly and with two posterior extensions with slightly expanded, rounded apices.

GENITALIA ♂ (Fig. 103). Uncus not extended. Socii small. Gnathos: not fused, not reduced. Valva: apex with distinctive field of short bristles; ampulla short, digitate, curved; sacculus not extended. Anellar complex: V-shaped, not completely surrounding aedeagus. Vinculum: ventral plate not emarginated, with short medial projection. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila fimbripedata* can be distinguished from *rufilimes* by the presence of a triangular subapical blotch on the fore wings (compare Pl. 1: 7, Figs 26 and 28). The greater extent of the brown markings usually distinguishes *fimbripedata* from *arpata* (compare Pl. 1: 7, Figs 27 and 28) but the character is not always reliable. Males of these two species can be distinguished by the shape of sternum A8, by the presence of an ampulla and by the absence of an extension of the sacculus in *fimbripedata* (compare Figs 102 and 103).

DISTRIBUTION. Material was examined from Colombia and Peru.

MATERIAL EXAMINED. **Colombia:** *Risaralda:* Siato, Rio Siato, Slopes of Choco, 1500 m, 1♂, ix.09. **Peru:** *Puno:* La Oroya, Rio Inambari, 940 m, 1♂ [holotype] wet season, iii.05 (*Ockenden*); 1♂, ix.05 (*Ockenden*).

*Depository:* BMNH.

### *Oospila zamaradaria* Fletcher

(Figs 29, 104)

*Oospila zamaradaria* Fletcher, 1951: 103. Holotype ♂, in BNNH. Type locality: VENEZUELA. Label data: Type; Rancho Grande n[ea]r Maracay, Ven[e]zuela] May 24 1946;

*Oospila zamaradaria* Fletcher Holotype ♂; Geometridae genitalia slide No. 15725♂. [Examined.]

[*Oospila zamaradensis* Fletcher, 1951: figs 6,7; pl. 1, fig. 1. Incorrect spelling.]

♂ (Fig. 29). Fore wing length 8–9 mm. Frons and vertex black. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings black. Fore wing: markings in form of a broad black band covering distal half of wing; discal spot small, dark. Hind wing: markings in form of a broad black band along termen, band narrower than in fore wing; discal spot small dark, or absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface black; sternum A2 without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 104). Uncus short, truncated. Socii large. Gnathos: not fused, not reduced. Valva: costa extended as broad process with spinose apex; ampulla absent; sacculus not extended. Anellar complex: distinctive; completely surrounding aedeagus. Vinculum: ventral plate a narrow band; U-shaped. Aedeagus: long and narrow; vesica with short cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila zamaradaria* can be distinguished from *atroviridis* by the absence of a white discal spot on the hind wings of *zamaradaria*. In addition, *atroviridis* usually has separate blotches at the apex and the tornus, whereas *zamaradaria* has a continuous dark brown band along the termen (compare Pl. 1: 17, Figs 29 and 59). The darker colour and greater extent of the wing markings distinguishes *zamaradaria* from *camilla* (compare Pl. 1: 5, Figs 21 and 29). The male genitalia can be recognised by the shape of the valvae, anellar complex and aedeagus (Fig. 104).

DISTRIBUTION. Known only from the transitional forest surrounding the Rancho Grande field station in the Henri Pittier National Park in northern Venezuela.

MATERIAL EXAMINED. **Venezuela:** *Aragua:* Rancho Grande, near Maracay: 1♂ [holotype] 24.v.1946; 1♂ [paratype] 16.vii.1946; 2♂ [paratypes]; 1♂, vi.1991 (*Cook*).

*Depository:* BMNH.

## The *miccularia* group

The *miccularia* group is a monophyletic group of three species defined by the presence of a field of large spines towards the apex of the dorsal (outer) surface of the male valva. As with the *astigma* group, vein  $R_1$  of the fore wing arises distad of the origin of vein  $M_1$ .

### *Oospila miccularia* (Guenée) **comb.n.**

(Figs 30, 105, 163)

*Racheospila miccularia* Guenée, 1857: 374. Holotype ♂, in BMNH. Type locality: FRENCH GUIANA. Label data: Ex Musaeo Ach. Guenée; Typicum Specimen; *Racheospila miccularia* Guenée sp. G. no 599: specimen typicum; 3242 [fig.]; Ex Oberthür Coll[ection] Brit[ish] Mus[eum] 1927–3; Geometridae genitalia slide No. 15795♂. [Examined.]

*Racheolopha miccularia* (Guenée); Warren, 1900: 137; Prout, 1912: 129; 1932: 54.

*Racheolopha imula* Dognin, 1911a: 23. LECTO-TYPE ♂, here designated, in USNM. Type locality: FRENCH GUIANA. Label data: Saint-Jean du Maroni, French Guiana (Le Moul). [Examined.] Synonymized with *Racheolopha miccularia* by Prout, 1932: 54.

*Phorodesma sarptaria* Möschler, 1881: 402. Holotype ♂, depository unknown. Type locality: SURINAM. Label data: Surinam: Paramaribo. [Not examined.] **Syn.n.**

*Comibaena sarptaria* (Möschler); Dognin, 1892: 186.

*Auophylla sarptaria* (Möschler); Warren, 1900: 132.

*Auophyllodes sarptaria* (Möschler); Prout, 1912: 131.

*Racheolopha sarptaria* (Möschler); Prout, 1932: 54.

♂, ♀ (Fig. 30). Fore wing length 6–9 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; cream irrorated with brown, with dark brown perimeters. Fore wing: costa pale brown; blotch at apex large, extending along costa, connected to blotch at tornus by narrow or broad band along termen; discal spot absent. Hind wing: blotch at apex long, narrow, connected to blotch at tornus by band along termen; blotch at anal margin absent; discal spot small, reddish brown, or absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface pink; elliptical

sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 emarginated posteriorly in male.

GENITALIA ♂ (Fig. 105). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; dorsal division narrowing strongly towards base and bearing large spines at apex; ampulla absent; sacculus extended into short process with serrated edge. Anellar complex: completely surrounding aedeagus; with large, medial, truncated projection and two pointed lateral processes. Vinculum: ventral plate V-shaped, with medial projection. Coremata absent. Aedeagus: short; vesica lacking cornutus.

GENITALIA ♀ (Fig. 163). Ostium: sterigma absent. Bursa copulatrix: ductus bursae narrow, weakly sclerotized and not striated, antrum absent; corpus bursae large; signum very large. Anterior apophyses very short.

DIAGNOSIS. The wing markings of *miccularia* are darker than in *albipunctulata*, and in *miccularia* the discal spot on the hind wing is small and red, not white as in *albipunctulata*. The pale brown colour of the blotches and the absence of a discal spot on the fore wings distinguishes *miccularia* from *ecuadorata*.

In *miccularia* the fore wing has more extensive markings than in *astigma*, *delacruz*i and *leucostigma*. In *miccularia* the blotch at the apex of the fore wing extends to the costa (compare Pl. 1: 6, Figs 22, 23, 24, and 30).

The male genitalia of *miccularia* are very similar to those of *euchlora* but the shape of the valva and the position of the spines on the valva differ. The wing markings of these two species are distinctive (compare Figs 30 and 31).

DISTRIBUTION. Widely distributed in tropical South America.

MATERIAL EXAMINED. **Costa Rica:** Guanacaste: Estacion Pitilla, 9 km S. Santa Cecilia, 700 m, 1♂, iii.1990 (*Rios, Moraga, Blanco*). **French Guiana:** *Guyane*: Cayenne, 1♂ [holotype of *miccularia*]; 3♂; Godebert Maroni, 1♂ (*Le Moul*); St. Jean du Maroni, 2♂, 3♀ (*Le Moul*); 1♂, vii. (*Le Moul*); 1♂, viii. (*Le Moul*); St. Laurent du Maroni, 2♂ (*Le Moul*); 1♂, x. (*Le Moul*); Nouveau Chantier, 1♀ [paralectotype of *imula*] ix. (*Le Moul*); 1♂ [lectotype of *imula*] (*Le Moul*); 1♂ [paralectotype of *imula*] (*Le Moul*); 1? (*Rodway*). **Guyana:** *East Demerara-West Coast Berbice*: Demerara River, 1♂, 2♀, vii.97. *Mazaruni-Potaro*: Potaro, 1♀, ii.1908 (*Klages*); *Kartabo*, 1♀, 27.vii.1925. **Venezuela:** 2♂, 1905



(*Schaus*). **Colombia**: *Boyaca*: Muzo, 400–800 m, 1♂ (*Fassl*). *Meta*: Upper Rio Negro, 800 m, 3♂ (*Fassl*). **Ecuador**: *Bulim*, 50 m, 1♀; 1♂, xii.00 (*Fl., M.*). **Peru**: *Amazonas*: Huambo, 1♂, IV<sup>er</sup> Trimestre 1889 (*Mathan*). *Puno*: Chaquimayo, 760–910 m, 3♂ (*Watkins*): 1♂, viii–x.10 (*Watkins*); *La Oroya*, Rio Inambari, Carabaya, 940 m, 1♂, wet season, x.04 (*Ockenden*); 3♂, wet season, iii.05 (*Ockenden*); 1♂, dry season, v.05 (*Ockenden*); 4♂, wet season, xi–xii.1905 (*Ockenden*); 1♂, 1♀ wet season, xii.05 (*Ockenden*); South East Peru: *Tinguri*, Carabaya, 1000 m, 1♂, dry season, viii.04 (*Ockenden*); 1♀ (*Ockenden*); *Rio Huacamayo*, Carabaya, 940 m, 1♂, dry season, vi.04, 1♂ (*Ockenden*). **Bolivia**: *Saampioni*, 800 m, 1♂, 1♀. *Santa Cruz*: *Rio Suruta*, 400 m, 1♂. **Brazil**: *Santa Cruz de la Sierra*, 450 m, 2♂ (*Steinbach*); *River Yapacani*, 600 m, 6♂, 1♀ (*Steinbach*). *Amapa*: *Para*, 3♂ (*Moss*). *Amazonas*: *Sao Paulo de Olivença*, 2♂ (*Germain*). *Mato Grosso*: 1♂, 1886 (*Germain*). *Minas Geraes*: *Caraça*, 1300 m, 1♀, 2–4.i.1985 (*Becker*). *Para*: *Unt. Amaz. Taperinha*, below *Santarem*, 1♀, 21–31.viii.27 (*Zerny*). **Locality unknown**: No data, 1♂ [holotype of *miccularia*].

*Depositories*: BMNH, CMNH, USNM, VOB.

### *Oospila euchlora* (Prout) comb.n.

(Figs 31, 106)

*Racheolopha euchlora* Prout, 1932: 54. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; 39, 27, *Burity*, 30 miles N[orth] E[ast] of *Cuyaba* 2250 ft. 1–14.vii.27 *Mato Grosso C.L. Collenette*; 515; On damp sand; *Joicey Bequest*. Brit[ish] Mus[eum] 1934–120; *Seitz VIII* p54, fig 8g; *Racheolopha euchlora* ♂ type Prout; *Geometridae genitalia* slide No. 15800 ♂. [Examined.]

♂ (Fig. 31). Fore wing length 8–9 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches absent; markings pink. Fore wing: costa pale brown; narrow, pink band along termen; discal spot pink. Hind wing: narrow, pink band along termen; anterior discal spot small, white; posterior discal spot small, pink. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 106). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; dorsal division not narrowing towards base, large spines on upper half; ampulla absent; sacculus extended into short pointed process. Anellar complex: completely surrounding aedeagus; with medial projection and two pointed lateral processes. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: relatively short; vesica lacking cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila euchlora* may be distinguished from *restricta* by the colour of the band along the termen: this is pink in *euchlora* and brown in *restricta*. In addition, *restricta* lacks a second, pink discal spot on the hind wing. The dorsal division of the valva of *euchlora* does not narrow towards the base as in *miccularia*, and the spines are not confined to the apex. The wing markings of these two species are distinct (compare Figs 30 and 31).

DISTRIBUTION. The only specimen was collected in the *Mato Grosso* province of Brazil.

MATERIAL EXAMINED. **Brazil**: *Mato Grosso*: 30 miles North East of *Cuyaba*, *Burity*, 690 m, 1♂ [holotype] 1–14.vii.27 (*Collenette*).

*Depository*: BMNH.

### *Oospila ecuadorata* (Dognin) comb.n.

(Pl. 1: 8, Figs 32, 107)

*Comibaena ecuadorata* Dognin, 1892: 186. LECTOTYPE ♂, here designated, in USNM. Type locality: ECUADOR. Label data: *Zamora Equateur*; *Comibaena ecuadorata* type ♂ [Dognin]; [pas des Druce un] Brit[ish] Mus[eum] Mar[ch] 92; dans *sarptaria* l'abdomen [?]; Dognin Collection; Type No. 32756 U.S.N.M; *Genitalia Slide* By MAC 57760 USNM. [Examined.]

*Auophyllodes ecuadorata* (Dognin); Prout, 1912: 131.

*Racheolopha sarptaria ecuadorata* (Dognin); Prout, 1932: 54.

*Racheolopha sarptaria ruboris* Prout, 1932: 54. LECTOTYPE ♂, here designated, in BMNH. Type locality: COLOMBIA. Label data: *Muzo*, Colombia 400–800 m Coll[ection] *Fassl*; *Racheolopha sarptaria ruboris* type ♂ Prout. [Examined.] **Syn.n.**

♂ (Pl. 1: 8, Fig. 32). Fore wing length 7–9 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings orange-

brown with brown irrorations and reddish perimeters. Fore wing: costa pale brown; blotches at apex and tornus joined by narrower band along termen; discal spot small, red-brown. Hind wing: band along termen, extending along distal third of costal and anal margins; blotch at anal margin absent; discal spot small, red-brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface pink; sternum A2 without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 emarginated posteriorly.

**GENITALIA** ♂ (Fig. 107). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: with subapical cleft; dorsal division with numerous spines; ampulla absent; sacculus extended into short, pointed process; distinctive, long process arising from base of valva at point where anellar complex merges. Anellar complex: surrounding aedeagus completely, with pair of lateral extensions. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus short, squat; vesica lacking cornutus.

**GENITALIA** ♀. Unknown.

**DIAGNOSIS.** *Oospila ecuadorata* can be distinguished from *miccularia* and *albipunctulata* by the presence of reddish discal spots on both fore and hind wings and by the greater intensity of red irrorations on the blotches. The male genitalia of *ecuadorata* can be recognised by the presence of long processes at the base of the valvae and spines on their dorsal divisions.

**DISTRIBUTION.** Distributed in Central America and northern and central areas of South America.

**MATERIAL EXAMINED.** **Panama:** Chiriqui: Chiriqui, 1♂. **Colombia:** Boyaca: Muzo, 400–800 m, 1♂ [lectotype of *ruboris*] (Fassl); 3♂ (Fassl); Upper Rio Negro, 800 m, 2♂ [paralectotypes of *ruboris*] (Fassl); Muzo, River Cantinero, 400 m, 1♂ (Fassl). **Ecuador:** Pastaza: El Topo, Rio Pastaza, 1300 m, 1♂ (Palmer). **Zamora-Chinchipe:** Zamora, 1♂ [lectotype of *ecuadorata*]; 6♂ [paralectotypes of *ecuadorata*]. **Peru:** Amazonas: Huambo, 2♂, IV<sup>er</sup> Trimestre 1889 (Mathan). **Puno:** Oconoque, Carabaya, 2100 m, 1♂, dry season, vii.1904 (Ockenden); Carabaya: Tinguri, 1000 m, 3♂, dry season, viii.1904 (Ockenden); 3♂, wet season, i.1905 (Ockenden); Carabaya: Rio Huacamayo, 940 m, 3♂, dry season, vi.04 (Ockenden); La Oroya, Rio Inambari, 940 m, 2♂, dry season, ix.04 (Ock-

enden); 1♂, wet season, x.04 (Ockenden); 2♂, iii.05 (Ockenden); 1♂, wet season, xi–xii.1905 (Ockenden); South East Peru, Santo Domingo, 1800 m, 1♂, xi.1904 (Ockenden). **Bolivia:** Salampioni, 600 m, 2♂, dry season, viii.01 (Simons). **La Paz:** Chimate, 760 m, 1♂, ix.00 (Simons); San Ernesto, 68°W 15°S, 1000 m, 6♂, viii.–ix.00 (Simons). **Santa Cruz:** Rio Sunta, 400 m, 1♂, v. (Steinbach). **Brazil:** Amazonas: Upper Amazon: Sao Paulo de Olivença, 1♂, i.1932 (Wucherpfennig). **Para:** Unt. Amaz. Taperinha, below Santarem, 1♂; 1♂, 10.vi.27 (Zerny).

**Depositories:** BMNH, USNM.

## The *athena* group

The *athena* group includes four species, two of which were formerly assigned to *Progonodes*. The anellar complex is reduced to just a flat plate.

### *Oospila athena* (Druce) comb.n.

(Pl. 1: 9, Figs 33, 108, 164)

*Racheospila athena* Druce, 1892: 89. Holotype, ♂ in MNHU. Type locality: PANAMA. Label data: Panama: Chiriqui (Trötsch) (mus[eum] Stau[dinger]). [Not examined.]

*Progonodes athena* (Druce); Prout, 1912: 135.

♂, ♀ (Pl. 1: 9, Fig. 33). Fore wing length 17–19 mm. Antenna of female bipectinate. Frons green, vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: dark green and white in about equal proportions, strong white patch at apex of both wings; discal spots absent. Fore wing: costa pale brown. Hind wing: white also conspicuous basally. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male, deeply emarginated posteriorly, and with two curved, posterior extensions with serrated margins.

**GENITALIA** ♂ (Fig. 108). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: costa extended into a long curved process; ampulla absent; sacculus lobed. Anellar complex composed of a flat V-shaped sclerite, not surrounding aedeagus. Vinculum: ventral plate broad, weakly emarginated. Aedeagus short; vesica lacking cornutus.



GENITALIA ♀ (Fig. 164). Ostium: sterigma absent. Bursa copulatrix: ductus bursae long, fairly narrow, antrum absent; weakly sclerotized and not striated; corpus bursae large; signum very small. Anterior apophyses very short.

DIAGNOSIS. *Oospila athena* can be distinguished from *lactecincta*, *nivetacta* and *sporadata* by the presence of large white apical patches on the wings (compare Pl. 1: 9 and 21, Figs 33, 35, 36 and 74). The absence of large, brown discal spots on the fore and hind wings distinguishes *athena* from *nivetacta* (compare Pl. 1: 9 and 21, Figs 33 and 74). The male genitalia of *athena* can be recognised from the unusual shape of the valvae and the anellar complex (Fig. 108). The shape of sternum A8 in the male is also distinctive (Fig. 108).

DISTRIBUTION. Specimens were examined from Panama, Costa Rica, Venezuela, Colombia, Ecuador and Peru.

MATERIAL EXAMINED. **Panama:** 1♀, no other data. **Costa Rica:** Cartago: Cachi, 1?; 1♀ (*Underwood*); Sitio, 1200 m, 3♀ (*Schaus*); 1♀; Tuis, 1♀ (*Schaus*); 1♀ (*Underwood*). **Puntarenas:** Finca Cafrosa, Estacion Las Mellitzas Parque Nacional Amistad, 1300 m, 1♀, xi.1989 (*Ramirez, Mora*); 35 km NE of San Vito at Las Alturas Field Station, 1500 m, 1♂, 9.vii.1992, 1♀, 2.vi.1992 (*Sourakov*), 1♀, 24.vi.1992 (*Snyder*), 2♂ 25,27.vi.1992 (*Snyder, Andrei*); Monte Verde, 1♀, 3.ix.1988 (*Covell*). **Venezuela:** Tachira Rio Frio, 600 m, 1♂, 2.x.1981 (*Fernandez, Clavijo, Chacon*). **Colombia:** Boyaca: Muzo, 400–600 m, 1♀ (*Fassl*); 1♂ (*Pratt*). **Ecuador:** Zamora-Chinchipe: 3 km (air) SE of Zamora, ca. 1200 m, 1♂, 1–3.vi.1986 (*McKamay*). Zamora: E. Cumbaratza, 800–900 m, 1♀, 21.xi.1970 (*Pena*). Morona-Santiago: Sevilla Don Bosco, 1070 m, 7♂, 8–11.v.1986 (*McKamay*). **Peru:** Cajamarca: Huancabamba, Cerro de Pasco, 1♂ (*Boettger*); North Peru: River Tabaconas, 1800 m, 1?, 1912 (*Pratt, Pratt*). **Junin:** Chanchamayo, 1♂, 1898 (*Schuncke*); Central Peru: La Merced, 910–1400 m, 1♀, xi–xii.19 (*Watkins*). **Loreto:** North Peru: Rentema Falls, Upper Maranon, 300 m, 1♀ (*Pratt, Pratt*). **Pasco:** Oxapampa, 2000 m, 1♀. **Puno:** Carabaya: La Union, Rio Huacamayo, 610 m, 3♂, 1♀, 1?, wet season, xi–xii.1904 (*Ockenden*). **Cuzco:** Cuzco, 8♂, 1♀, i,ii,iii.1952 (*Waylkowski, Waylsowski*).

Depositories: AMNH, BMNH, INBio, UCVM.

## *Oospila holochroa* (Prout) comb.n.

(Figs 34, 109)

*Progonodes holochroa* Prout, 1912: 417. Holotype ♂, in BMNH. Type locality: PANAMA. Label data: Type; Chiriqui S.K.B; L.B. Prout Coll[ection] B[ritish] M[useum] 1939–643; *Progonodes holochroa* Prout N.Z. p.417 ♂ type; [?]; Geometridae genitalia slide No. 15768 ♂. [Examined.]

*Progonodes stagonata holochroa* Prout, 1933: 60. *Racheospila delicatescens* Dyar, 1914: 229. Holotype ♀, in USNM. Type locality: PANAMA. Label data: Panama: Panama Canal Zone, Porto Bello, iii.1911 (Busck); Type No. 16056 U.S.N.M. [Examined.] **Syn.n.**

*Oospila delicatescens* (Dyar); Prout, 1932: 56.

♂ (Fig. 34). Fore wing length 15 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches absent; markings pale brown. Fore wing: costa pale brown; termen with beige fringe and brown line proximal of fringe interrupted by small white dots where veins meet termen; discal spot small, brown. Hind wing: as fore wing but anterior discal spot large, white and posterior discal spot small, indistinct and white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 without brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of A2 and A3; sternum A8 strongly sclerotized with deep medial division, extended into two processes posteriorly.

GENITALIA ♂ (Fig. 109). Uncus with two short apical processes. Socii large. Gnathos: not fused, not reduced. Valva: ampulla absent; sacculus a blunt short lobe; rest of valva narrow. Anellar complex: a flat plate, not completely surrounding aedeagus. Vinculum: ventral plate broad, emarginated with medial projection. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila holochroa* can be distinguished from *lacteguttata* by the presence of two white discal spots on the hind wings and by the absence of a proximal pair of spurs on the hind tibia. The presence of a brown discal spot on the fore wings distinguishes *Oospila holochroa* from *immaculata* (compare Figs 34 and 61). The male genitalia of *holochroa* can be recognised by the

unusual shape of the uncus and the valvae (Fig. 109).

**DISTRIBUTION.** Only a single specimen was examined, from Chiriqui in Panama.

**MATERIAL EXAMINED.** **Panama:** *Chiriqui*: 1♂ [holotype]

*Depository:* BMNH.

### *Oospila lactecincta* (Warren)

(Figs 35, 110, 165)

*Racheolopha lactecincta* Warren, 1909: 85. **LECTOTYPE** ♂, here designated, in BMNH. Type locality: BRAZIL. Label data: Fonte Boa, Upp[er] Amazon, July 1907 (S.M. Klages); *Racheolopha lactecincta* type ♂ War[r]en; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15732 ♂. [Examined.]

*Oospila lactecincta* (Warren); Prout, 1912: 134; 1933: 59.

♂, ♀ (Fig. 35). Fore wing length 13–16 mm. Antenna of female bipectinate. Frons and vertex green. Interantennal fillet white. Thorax: dorsal surface white. Wings: mainly white with dark green markings. Fore wing: costa pale brown proximally, green distally and along termen; large green triangular patch, variously mottled with white, in wing centre; blotches absent; discal spot small, dark brown. Hind wing: as fore wing but green triangular patch much weaker and diffuse; discal spot in form of a white streak. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 of male with emarginated posteriorly.

**GENITALIA** ♂ (Fig. 110). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: short, constricted subapically; apex rounded, denticulate, not divided; ampulla absent; sacculus not extended. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broad, V-shaped. Coremata absent. Aedeagus: vesica with two large cornuti.

**GENITALIA** ♀ (Fig. 165). Ostium: sterigma elliptical, with posterior edge emarginated. Bursa copulatrix: ductus bursae long, with large antrum, strongly sclerotized and striated below antrum; corpus bursae large, approximately

spherical; signum small. Anterior apophyses short.

**DIAGNOSIS.** *Oospila lactecincta* can be distinguished from *athena* and *sporadata* by the position of solid areas of white on the fore wings and the relatively discrete triangular green patch on the fore wing (compare Pl. 1: 9, Figs 33, 35 and 36). The male genitalia of *lactecincta* can be recognised by the shape of the valvae (Fig. 110).

**DISTRIBUTION.** Specimens were examined from lowland Peru and the Amazonas region of Brazil.

**MATERIAL EXAMINED.** **Peru:** *Loreto*: North Peru: Rentema Falls, Upper Marañon, 300 m, 1♀ (*Pratt, Pratt*). **Brazil:** *Amazonas*: Fonte Boa, Upper Amazon, 1♂ [lectotype] vii.1907 (*Klages*); 1♀ [paralectotype] v.1906 (*Klages*); 1♀ [paralectotype] vii.1906 (*Klages*); 2♀, viii.1907.

*Depository:* BMNH.

### *Oospila sporadata* (Warren)

(Figs 36, 111, 166)

*Racheolopha sporadata* Warren, 1906: 426.

Holotype ♂, in USNM. Type locality: FRENCH GUIANA. French Guiana: Maroni, S[ain]t Jean, iii.1904; Type No. 9199 U.S.N.M. [Examined.]

*Oospila sporadata* (Warren); Prout, 1933: 59.

*Progonodes curvimargo* Herbulot, 1991: 110.

Holotype ♂, in HERB. Type locality: Ecuador. Label data: Ecuador Km 17 de la route Limon Méndez 900 m – 12 et 13.i.1975 C. Herbulot; *Progonodes curvimargo* H[er]b[ulot] [u-][l]l[o]t Holotype. [Examined.] **Syn.n.**

♂, ♀ (Fig. 36). Fore wing length 14–20 mm. Antenna of female bipectinate. Frons and vertex green. Interantennal fillet white. Thorax: dorsal surface white. Wings: mottled white and green, small patches of solid green in some areas; blotches absent. Fore wing: costa pale brown; green speckling concentrated to form mainly green areas along termen and at centre of wings; discal spot absent. Hind wing: similar to fore wing, except costa not brown; discal spot absent. Hind leg: proximal spurs absent; brush of long hair-like scales present on tibia of male. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male with short bifurcate apical extension.

**GENITALIA** ♂ (Fig. 111). Uncus short, pointed.



Socli large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, robust, with truncated, denticulate apex; sacculus extended into long, strongly sclerotized, pointed process. Anellar complex: completely surrounding aedeagus; with long anterior extension. Vinculum: ventral plate large, emarginated. Coremata absent. Aedeagus: vesica with forked cornutus; strongly sclerotized and denticulate at phallosome.

GENITALIA ♀ (Fig. 166). Ostium: weakly sclerotized peripherally, with shallow membranous pocket on each side; sterigma absent. Bursa copulatrix: ductus bursae and antrum indistinct, narrow immediately below ostium, widening distally, strongly sclerotized and striated; bursa copulatrix large; signum small. Anterior apophyses short.

DIAGNOSIS. *Oospila sporadata* can be distinguished from *athena* and *lactecincta* by the more speckled appearance of the wing markings, which lack the solid patches of green and white found in the others (compare Pl. 1: 9, Figs 33, 35 and 36). The male genitalia can be recognised by the short, robust ampulla, the long anterior extension of the anellar complex and the denticulate aedeagus (Fig. 111).

DISTRIBUTION. Distributed widely in tropical South America.

MATERIAL EXAMINED. **French Guiana:** *Guyane*: St. Jean du Maroni, 7♂, 1♀ (*Le Moul*); 1♂, x. (*Le Moul*); 4♂, 1♀ (*Le Moul*); 1♂ [holotype of *sporadata*] 2♂, 2♀; Nouveau Chantier, 1♂, 1♀ (*Le Moul*). Route de l'Est, 1♀, 12.xi.1980 (*Bleuzen*). **Surinam:** *Marowijne*: Aroewarwa Creek, Marowym valley, 1♂, iv.05 (*Klages*): 1♂, v.05 (*Klages*). **Guyana:** *Mazaruni-Potaro*: Omai, 1♂, 1♀. *Bartica*: Kartabo, 1♀, 6.vi.1920 (*New York Zoological Society*). **Colombia:** *Amazonas*: Leticia, 1♂ [paratype of *curvimargo*] viii.1977 (*Moinier*). **Ecuador:** *Pasatza*: Sarayacu, 1♂ (*Buckley*). 17 km de La route Limon, 900 m, 1♂ [holotype of *curvimargo*] 12–13.i.1975 (*Herbulot*); 1♀ [paratype of *curvimargo*] (*Herbulot*). **Peru:** *Junin*: River Chuchurras, River Palcazu, 320 m, 1♂ (*Hoffmann*). *Puno*: Yahuar Mayo, 610 m, 1♂, iv.1912. **Brazil:** *Amapa*: Para, 1♂, 1♀ (*Moss*). *Amazonas*: Fonte Boa, 7♂, 2♀, vii.06 (*Klages*); 1♂, ix.06 (*Klages*); 1♂, 1♀, vii.07 (*Klages*); 1♂, viii.06 (*Klages*); 1♂, xi.06 (*Klages*).

*Depositories:* AMNH, BMNH, HERB, USNM.

## The *includaria* group

The *includaria* group includes two distinctively marked species (*includaria* and *leucothalera*) (Pl. 1: 10, Figs 37, 38), formerly assigned to the genus *Auophylla*. The male of *leucothalera* is unknown so the male genitalia cannot be compared with those of *includaria* and the monophyly of the group requires confirmation.

### *Oospila includaria* (Herrich-Schäffer) comb.n.

(Pl. 1: 10, Figs 37, 112, 167)

*Thalera includaria* Herrich-Schäffer, 1855, fig. 341; 1856: 36, 62, 82. Holotype ♂, MNHU. Type locality: GUATEMALA. [Not examined.]

*Phorodesma* (?) *inclusaria* Guenée, 1857: 371. [Incorrect spelling.]

*Comibaena inclusaria* (Guenée); Druce, 1892: 88.

*Comibaena* (?) *inclusaria* (Guenée); Walker, 1861: 570.

*Auophylla includaria* (Herrich-Schäffer); Warren, 1897: 423–424; Prout, 1912: 130; 1932: 52.

*Comibaena magnifica* Schaus, 1901: 252. LECTOTYPE ♂, here designated, in USNM. Type locality: BRAZIL: Sao Paulo. [Examined.] **Syn.n.**

*Auophylla magnifica* (Schaus); Prout, 1912: 130; 1932: 52.

*Auophylla multiplagiata* Warren, 1897: 424; Prout, 1912: 130; 1932: 52. Holotype ♂, in BMNH. Type locality: PARAGUAY. Label data: Paraguay Dr Bohls; Rothschild Bequest B[ritish] M[useum] 1939–I; *Auophylla multiplagiata* type ♂ Warr[en]; Geometridae genitalia slide No. 15806 ♂. [Examined.] **Syn.n.**

*Auophylla basiplaga* Warren, 1907, 201; Prout, 1912, 130; 1932: 52. Holotype ♂, in BMNH. Type locality: PARAGUAY. Label data: Type; Sapucay, Paraguay, 9.vii.02 (W. Foster); Rothschild Bequest B[ritish] M[useum] 1939–I; *Oospila basiplaga* type ♂ Warr[en]; Geometridae genitalia slide No. 15805 ♂. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 10, Fig. 37). Fore wing length 9–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green and cream with brown detail; cream areas represent blotches, varying significantly in area. Fore wing: costa brown; often brown submarginal line present; green areas either much more extensive than cream areas (e.g. as in Fig.

37), or approximately equalling cream areas in extent; discal spot brown. Hind wing: extent of markings approximately as in fore wing; discal spot absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 not strongly sclerotized, simple.

**GENITALIA** ♂ (Fig. 112). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; apex with row of denticles; ampulla absent; sacculus extended into strongly sclerotized, pointed process; additional, pointed sub-apical extension. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 167). Ostium: with a shallow pocket on each side; sterigma approximately elliptical. Bursa copulatrix: ductus bursae long, wide, weakly sclerotized and not striated, antrum absent; corpus bursae large; signum quite large. Anterior apophyses short.

**DIAGNOSIS.** The wing markings of *Oospila includaria* vary considerably. Specimens where cream markings are extensive are rather similar to those of *obeliscata*. However, *includaria* is smaller than *obeliscata* and has smaller discal spots (compare Pl. 1: 10 and 15, Figs 37 and 53). The presence of a white blotch at the base of the wings and the absence of a constriction of the anterior of the green area at the middle of the fore wing distinguishes *includaria* from *leucothalera* (compare Pl. 1: 10, Figs 37 and 38). The male genitalia of *includaria* can be recognised by the extension of the middle part of the valva into a pointed process (Fig. 112).

**DISTRIBUTION.** Material has been examined from Peru, Bolivia, Argentina, Paraguay and Brazil.

**MATERIAL EXAMINED.** **Peru:** Puno: Carabaya: La Union, Rio Huacamayo, 610 m, 1♂, wet season, xii.1904 (*Ockenden*). **Argentina:** Sierra de la Ramada, 650 m, 1♂ (*Schreiter*); Ocampo, El Chaco, 1♂, i.1906 (*Venturi*). **Misiones:** Haut Parana, San Ignacio Missions, 4♂. **Salta:** North Argentina: Salta, 1♀, ii.05 (*Steinbach*). **Tucuman:** 1♂, 1♀, 1? (*Steinbach*); 1♂, 1♀, 1918, ii.1949 (*Foerster*); Ciudad Tucuman, 1♀, iii.1903 (*Monetti*); Dept. Ledesma, Parque Nacional Calilegua, 2000–2500 m, 11–13 km on dirt-track/

footpath, upland mesic forest, 1♂, 14.ii.1991 (*Johnson et al.*); Parque Nacional Calilegua, near entrance, 5.5–7.5 km W of Rt34, 1600 m, mesic forest along river 1♂, 14.ii.1991 (*Johnson et al.*). **Jujuy:** Jujuy, 17♂, 9♀, xii.1944, iv.1948, ii,iii.1949, ii,iii,xii.1950, ii.1951 (*Sperry, Sperry Coll.*); Jujuy, 6♂, 1♀, iv,vi,xi.1948, iii.1949, ii,iii,xii.1950, ii.1951 (*Foerster*). **Paraguay:** *Paraguari:* Sapucay, 1♂ [holotype of *basiplaga*] 9.vii.02 (*Foster*); 1♀, 2.xi.03 (*Foster*); 1♂, 19.vi.03 (*Foster*); 1♀, 15.xi.03 (*Foster*); 1♀, 30.xi.04; 1♂ [holotype of *multiplagiata*] (*Bohls*). **Bolivia:** *La Paz:* El Choro, Tungas de La Paz, 900 m, 1♂, 7–8.i.1976 (*Pena*). **Brazil:** *Brazilia:* 1♂ (*Dohrm*); Rio Grande do Sul, 2♂ (*[Stgr]*). *Bahia:* Iguassu, 1♀. *Mato Grosso:* 1♂, 1886 (*Germain*); 1♂, 1886. *Minas Geraes:* Uberaba, 1♂, 1♀ (*Le Moul*). *Parana:* Castro, 890 m, 1♂, 1♀ (*Jones*). *Sao Paulo:* Sao Paulo, 700 m, 1♂ [lectotype of *magnifica*] 1♀; South East Brazil: Sao Paulo, 700 m, 1♀ (*Jones*). *Santa Catarina:* Blumenau, 1♂, 1♀, 26.iv.29 (*Schade*); Rio Vermelho, 1♀, i.1937 (*Hoffmann*); Jaragua do Sul, 1♀, xi.1934 (*Hoffmann*); Neuvo Teutonia, 4♂, iv.1953, 1♂, v.1953, 1♀, 15.ii.1953 (*Plaumann*) (*Sperry Collection*). **Locality unknown:** *Guerica* ?, 1♀.

*Depositories:* AMNH, BMNH, USNM.

### *Oospila leucothalera* (Prout) **comb.n.**

(Figs 38, 168)

*Auophylla leucothalera* Prout, 1932: 52. Holotype ♀, in BMNH. Type locality: BRAZIL. Label data: Bresil Caraca P. Germain 2° Semestre 1884; Ex. Oberthür Coll[ection] Brit[ish] Mus[eum] 1927–3; *Auophylla leucothalera* ♀ type Prout; Geometridae genitalia slide No. 15807 ♀. [Examined.]

♀ (Fig. 38). Fore wing length 9–10 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: dark green patches, and cream with brown detail. Fore wing: costa pale brown; termen with broken brown line; subtriangular green patch at wing base, larger green area in centre of wing sometimes separated into two patches; discal spot a short brown line. Hind wing: single green patch; discal spot absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream.

**GENITALIA** ♂. Unknown.

**GENITALIA** ♀ (Fig. 168). Ostium: sterigma



large, crescent-shaped, with shallow pocket on each side. Bursa copulatrix: ductus bursae short, wide, with large antrum, strongly sclerotized and striated below antrum; corpus bursae large; signum absent. Anterior apophyses relatively long.

**DIAGNOSIS.** *Oospila leucothalera* lacks the white blotch at the base of the wing of *includaria* and the shape of the green marking at the centre of the fore wing differs (compare Pl. 1: 10, Figs 37 and 38).

**DISTRIBUTION.** Known only from southern areas of Brazil.

**MATERIAL EXAMINED.** **Brazil:** Queluz, 1♀ [paratype] (*Germain*). Minas Geraes: Caraça, 1♀ [holotype] 2° Semestre 1884 (*Germain*). São Paulo: Alto de Serra, 1♀ [paratype] xi.1922 (*Spitz*); Serra do Mar, 1♀, iv.1927 (*Wucherpfennig*).

*Depository:* BMNH.

## The *albicoma* group

The monophyly of the *albicoma* group, which includes four species, is based on the form of the male anellar complex. The transtilla and juxta are fused to form a sclerite completely surrounding and supporting the aedeagus. The anellar complex is distinctive and lacks any processes or extensions.

### *Oospila albicoma* (Felder & Rogenhofer)

The species includes two subspecies with identical male genitalia, but with distinctive wing markings. One of these, *albicoma nasuta*, is confined to Trinidad.

### *Oospila albicoma albicoma* (Felder & Rogenhofer)

(Pl. 1: 11, Figs 39, 113, 169)

*Racheospila albicoma* Felder & Rogenhofer, 1875: pl 127, fig. 22. Holotype ♂, in BMNH. Type locality: AMAZONAS. Label data: Holotype; 146; Novara CXXVII p 22, *Racheospila albicoma* Amaz[onas] m[ale]. Rothschild Bequest B[ritish] M[useum] 1939-1; Geometridae genitalia slide No. 15713 ♂. [Abdomen incorrectly associated, see Remark.] [Examined.]

*Oospila albicoma* (Felder & Rogenhofer); Warren, 1900: 136; Prout, 1912: 133; 1933: 57.

*Oospila minorata* Warren, 1909: 83. LECTOTYPE ♂, here designated, in BMNH. Type

locality: BRAZIL. Label data: Type; Fonte Boa, Upp[er] Amazonas, May 1906. (S.M. Klages); *Oospila minorata* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-1; Geometridae genitalia slide No. 15715 ♂. Synonymized with *albicoma* by Prout, 1933: 57. [Examined.]

*Oospila deliciosa* Thierry-Mieg, 1916: 42. Prout, 1933: 57. LECTOTYPE ♂, here designated, in MNHN. Type locality: FRENCH GUIANA. Label data: Type; Guyane Française St-Jean du Maroni Collection Le Moulit; 1917 Coll[ection]. P. Thierry-Mieg Museum Paris; *Oospila deliciosa* t.m. misc. ent., XXIII, no10-11, p[4]2, 1916. type original. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 11, Fig. 39). Fore wing length 14-19 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream heavily or lightly irrorated with pale brown, with dark brown perimeters. Fore wing: costa pale brown; blotch at apex large, extending along costa, not connected to blotch at tornus; blotch at tornus large, extending to cover discal spot; discal spot small, dark brown. Hind wing with blotches at apex and tornus large, occasionally connected by band along termen; blotch at anal margin small, narrow; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite in intersegmental membrane between segment A2 and A3 of male present; sternum A8 of male emarginated posteriorly.

**GENITALIA** ♂ (Fig. 113). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; apex of dorsal division irregular; ampulla narrow, digitate, denticulate towards apex; sacculus extended into short, blunt process. Anellar complex completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with long, narrow cornutus.

**GENITALIA** ♀ (Fig. 169). Ostium: sterigma absent. Bursa copulatrix: ductus bursae long, antrum large; strongly sclerotized and striated below antrum; corpus bursae fairly small, approximately spherical; signum quite large. Anterior apophyses very short.

**DIAGNOSIS.** *Oospila albicoma albicoma* can be

distinguished from most other species with cream blotches by the large size of the blotch at the tornus of the fore wing, which extends to cover the discal spot. The shape of this blotch also differs from that in *depressa* and *longiplaga* (compare Pl. 1: 11 and 20, and Figs 39, 66, 72).

*Oospila albicoma albicoma* is smaller than *concinna*, and the male bears brushes of long hair-scales on sternum A2 and a small elliptical sclerite on the intersegmental membrane between sternum A2 and A3; these are absent from *concinna*. The shape of the distal end of the valva distinguishes males; also the aedeagus of *albicoma albicoma* bears a short cornutus, which is absent from *concinna* (compare Figs 113 and 114). In the female, the sterigma is absent from *albicoma albicoma* but present in *concinna* (compare Figs 169 and 170).

The shape of the blotch at the apex of the fore wing distinguishes *albicoma albicoma* from *lunicincta*. This blotch extends along the costa in *albicoma albicoma* but not in *lunicincta* (compare Pl. 1: 11, Figs 39 and 67).

*Oospila albicoma albicoma* can be distinguished from *albicoma nasuta* by the larger size of the blotch at the tornus of the fore wing and also by the absence of a short digitate extension of this blotch in *albicoma albicoma* (compare Pl. 1: 11, Figs 39 and 40).

**DISTRIBUTION.** Widely distributed in tropical South America and in Central America south of Costa Rica.

**REMARK.** The holotype has an incorrectly associated abdomen (the genitalia of this abdomen belong to a species of *Semiothisa* Hübner (Geometridae: Ennominae)).

**MATERIAL EXAMINED.** **Costa Rica:** *Alajuela:* Finca San Gabriel, 2 km South West of Dos Rios, 630 m, 1♂, 8.ii.1983 (Janzen, Hallwachs); 1♂, 5.v.1984 (Janzen, Hallwachs); Finca Campana, 5 km North West Dos Rios, 750 m, 1♂, 21.iii.1985 (Janzen, Hallwachs); Finca San Gabriel, 630 m, 16 km East of Quebrada Grande, 3♂, 1♀; Estacion Pitilla, 700 m, 9 km South of Santo Cecilia, 1♀, i.1988 (Chacon, Espinosa); 4♂, vii.1988 (Scoble, Brooks); Finca San Gabriel, 16 km East North East of Quebrada Grande, 650 m, 2♂, 8.ii.1983 (Janzen, Hallwachs); 2♂, 12.iii.1983 (Janzen, Hallwachs); 1♀, 11.xi.1983 (Janzen, Hallwachs); 1♂, 5.v.1984 (Janzen, Hallwachs); 1♂, vii.1988 (Gauld, Mitchell). *Cartago:* I.I.C.A. Grounds, 600 m, 1♂, 24–26.vi.1974 (Watson); Orosi, 1200 m, 2♀ (Fassl); Tuis, 2♂; 3♂. *Guanacaste:* Estacion Pitilla, 700 m, 9 km South of Santa Cecilia,

3♂, 1♀; Finca Biesnan, Colonia Refug., Los Angeles, 11 km East of Quebrada Grande, 500 m, 1♂, 13.vi.1985 (Janzen, Hallwachs); 4 km East Casetilla Rincon National Park, 750 m, 1♂, 22.v.1982 (Janzen, Hallwachs). *Heredia:* Chila-mate, 100 m, 3♂, 1♀, 11.viii.1986 (Covell); Finca La Selva Biological Station, Puerto Viejo Sarapiquí, 40 m, 3♂, 14–15.xi.1982 (Janzen, Hallwachs); 1♂, 6–9.iii.1985 (Janzen, Hallwachs); 1♂, ii.1986 (Chavarria, Chacon); 2♂, iii.1986 (Chavarria); 2♂, 1♀, vii.1986 (Chavarria); 3♂, 1♀, xi.1986 (Chavarria); 1♂, iii.1987 (Chavarria); 6♂, iv.1987 (Chavarria); 1♂, v.1987 (Chavarria); 3♂, x.1987 (Chavarria); 1♂, xii.1987 (Chavarria). *Limon:* Cerro Tortuguero, Parque Nacional Tortuguero, 0–100 m, 3♂, 27.iii.1981 (Janzen, Hallwachs); 2♂, 30.v.1984; Sixaola river: 1♂, 1♀. *Osa Peninsula:* Sirena, Corcovado National Park, 3♂, 19–27.iii.1981 (Janzen, Hallwachs). *Puntarenas:* Fila Esquinas, 35 km South of Palmar Norte, 8°45' x 83°20', 150 m, 3♂, 7–8.i.1983 (Janzen, Hallwachs). *San Jose:* Estacion Carrillo, Parque Nacional Braulio Carrillo, 700 m, 1♂, 1♀, ix.1984 (Chacon); 1♂, x.1984; Cario, 1♂; La Fuente, Turrialba, 1♂. **French Guiana:** *Guyane:* Mana River, 3♂, v.1917; St. Jean du Maroni, 1♂ [lectotype of *deliciosa*]; 2♂, 1♀; St. Laurent du Maroni, 1♀ (Le Moult); 1♂. **Surinam:** *Marowijne:* Aroewarwa Creek, Maroewym valley, 1♂, v.1905 (Klages). **Guyana:** *East Demerara-West Coast Berbice:* Rio Demerara, 1♀. *Mazaruni-Potaro:* Omai, 1♂; Rockstone, Essequibo, 1♂. Potaro River, 1♀, 1904 (Roberts); Tumatumari, 1♂, xii.1907 (Klages); Potaro, 2♂, 1♀, ii.1908 (Klages). **Venezuela:** Briceno, 5♂. **Amazonas:** Parque Nacional Dida, 1♂; Rio Baria, dept Rio Negro, 1♂. San Carlos de Rio Negro, 1♂, 2♀. **Bolivar:** El Boninche Reserve, Forestal Imataca, 200 m, 1♂. El Dorado, 1?; El Dorado, Santa Elena, 125 km, 1100 m, 1♂. *Carabobo:* Las Quignas, Esteban Valley, 3♂; San Esteban, 3♂; Campo Bello, Rio Zoikan, 2♂. *Merida:* 7♂. **Colombia:** *Boyaca:* Muzo, 400–800 m, 8♂ (Fassl). *Cauca:* Gorgona Island, 60 m, 1♀, 17.x.24 (Collenette). *Meta:* Buena Vista, 1♂; Cundinamarca, La Mesa, 1♂; Upper Rio Negro, 800 m, 2♂ (Fassl). **Ecuador:** *Napo:* Garzacocho, 68 km (air) E. Coca, c. 210 m, 1♂, 13–17.iii.1986 (McKamey); Finca San Jorge ca. 10 km (air) E. Coca on Rio Napo, 1♂, 7–10.iii.1986 (McKamey). *Zamora:* E. Cumbaratza, 800–900 m, 1♂, 21.xi.1970 (Pena). **Peru:** *Cajamarca:* Charape River, Tabaconas, 2♂. *Junin:* Utcuyacu, 1♂. *Loreto:* Rio Ampiyacu, Putomayo, 1♂. *Madre de Dios:* Tambopata Reserve, 30 km South West of Puerto



Maldonado, 1♂, 16–22.x.1983 (Covell). Puno: Yahuar mayo, 370 m, 1♂, iv.1912; La Union, Rio Huacamayo, 610 m, 2♂, wet season, xi.1904 (Ockenden); 1♂, wet season, xii.1904 (Ockenden); 2♂, xi–xii.1904 (Ockenden); Rio Huacamayo, 940 m, 3♂, dry season, vi.04 (Ockenden); Oconeque, 3♂; Quinton, 3♂; Santo Domingo, 1800 m, 1♀, wet season, iii.02 (Ockenden); 2♂, xi.1904 (Ockenden); 1♀; Tinguri, 1000 m, dry season, 3♂, 2♀, viii.1904 (Ockenden); La Oroya, Rio Inambari, 940 m, 5♂, dry season, ix.1904 (Ockenden); 5♂, 1♀, wet season, iii.05, 5♂, 1♀ (Ockenden); 3♂, ix.05 (Ockenden); 4♂, wet season, xi–xii.1905 (Ockenden); 2♂, wet season, xii.05 (Ockenden); 1♂, 1♀, wet season, i.1906 (Ockenden). **Brazil:** San Joas, Solimoes, 1♂. Amapa: Para, 1♀ (Moss). Amazonas: Fonte Boa, 1♂ [lectotype of *minorata*] v.1906 (Klages); 4♂, vii.06 (Klages); 2♂, ix.06 (Klages); 1♂, vii.07 (Klages); Teffe, 1♂, viii.1935 (Moss); 3♂; Sao Paulo de Olivença, 2♂; 1♀, i.1932 (Wucherpennig); Rio Purus, 1♂, xii.1921 (Klages). Rondonia: Calama, River Madeira, below River Machados, 1♂, viii–x.07 (Hoffmann). ‘Amazonas’: 1♂ [holotype of *albicomma*].

*Depositories:* AMNH, BMNH, CMNH, CVCJ, INBio, MNHN, USNM, UCVN.

### *Oospila albicomma nasuta* Warren stat.n.

(Figs 40, 113)

*Oospila nasuta* Warren, 1909: 83; Prout, 1912: 134; 1933: 58. LECTOTYPE ♂, here designated, in BMNH. Type locality: TRINIDAD. Label data: Type; Caparo, Trinidad, Dec[ember] 1905. (S. M. Klages); Rothschild Bequest B[ritish] M[useum] 1939–I; *Oospila nasuta* type ♂ Warr[en]; Geometridae genitalia slide No. 15718 ♂. [Examined.]

♂ (Fig. 40). Fore wing length 12 mm. As for *a. albicomma* but: fore wing: blotch at tornus quite large, but not extending as far as discal cell, with short digitate extension; discal spot absent. Hind wing: blotch at apex large; blotch at tornus smaller; blotch at anal margin narrow; discal spot small, white.

GENITALIA ♂ (Fig. 113). As for *albicomma albicomma*.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila albicomma nasuta* can be distinguished from other species with cream blotches by the form of the blotch at the tornus of the fore wing: *albicomma nasuta* has a short,

digitate extension of this blotch which does not occur in other species (Fig. 40).

DISTRIBUTION. Known only from Trinidad.

MATERIAL EXAMINED. **Trinidad:** Saint George East: Caparo, 1♂ [lectotype] xii.1905 (Klages); 1♂ [paralectotype].

*Depository:* BMNH.

### *Oospila concinna* Warren

(Figs 41, 114, 170)

*Oospila concinna* Warren, 1900: 136; Prout, 1912: 133; 1933: 57. LECTOTYPE ♂, here designated, in BMNH. Type locality: VEN-EZUELA. Label data: Type; Merida 1630 m 97 Briceno; Rothschild Bequest B[ritish] M[useum] 1939–I. *Oospila concinna* ♂ Warr[en]; Geometridae genitalia slide No. 15710 ♂. [Examined.]

*Oospila eminens* Schaus, 1912a: 428. LECTOTYPE ♂, here designated, in BMNH. Type locality: COSTA RICA. Label data: Paratype; Juan Vinas Costa Rica June W. Schaus; *Oospila eminens* Sch[aus]; *Oospila eminens* Sch[aus] (cotype); L.B. Prout Coll[ection] B[ritish] M[useum] 1939–643; Geometridae genitalia slide No. 15711 ♂. [Examined.] **Syn.n.**

*Oospila concinna eminens* Schaus; Prout, 1933: 57.

*Oospila albicomma matura* Prout, 1933: 57. LECTOTYPE ♀, here designated, in BMNH. Type locality: BRAZIL. Label data: Paratype; 8.4.24 Zikan Itatiaya (Zicht); *Oospila albicomma matura* Prout ♀ parat[ype]; L.B. Prout Coll[ection] B[ritish] M[useum] 1939–643; Geometridae genitalia slide No. 15712 ♀. [Examined.] **Syn.n.**

♂, ♀ (Fig. 41). Fore wing length 19–26 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream variously irrorated with pale brown (forms *eminens* and *matura* with blotches darker), with dark brown perimeters. Fore wing: costa pale brown; blotch at apex large, sometimes very narrowly connected, along termen, to blotch at tornus; blotch at tornus very large, expanding towards centre of wing, extending to include discal spot, abruptly constricted towards termen (not wedge-shaped as in *depressa*, compare Pl. 1: 20, Figs 41 and 72); discal spot large, brown. Hind wing: blotches at apex and tornus entirely separate; blotch at anal margin small, narrow; discal spot small, white.

Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of sternum A2 and A3 of male; sternum A8 emarginated posteriorly in male.

GENITALIA ♂ (Fig. 114). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; dorsal division rounded apically; ampulla short, denticulate; sacculus extended into long, narrow, weakly sclerotized process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate emarginated. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀ (Fig. 170). Ostium: sterigma approximately rectangular, emarginated posteriorly. Bursa copulatrix: ductus bursae long, antrum large, below antrum narrow, strongly sclerotized and striated; signum large. Anterior apophyses short.

DIAGNOSIS. *Oospila concinna* can be distinguished from other species with cream blotches (except *albicoma albicoma*) by the size and shape of the blotch at the tornus of the fore wing.

*O. concinna* is larger than *a. albicoma*, but the wing markings are indistinguishable. Males of *concinna* can be distinguished by the absence of a small elliptical sclerite and brushes of long hair-scales on sternum A2. The male genitalia of these two species are also very similar, but *concinna* lacks a cornutus on the vesica, and the shape of the apex of the valva is rounded in *concinna*, but sculpted in *albicoma albicoma* (compare Figs 113 and 114). The female genitalia can be distinguished by the presence of a sterigma in *concinna* (compare Figs 169 and 170).

The larger size and absence of a short, digitate extension of the blotch at the tornus of the fore wing distinguishes *concinna* from *albicoma nasuta* (compare Figs 40 and 41).

DISTRIBUTION. Widely distributed in Central and South America.

REMARK. Only one syntype (designated as lectotype, above) of *albicoma matura* was located.

MATERIAL EXAMINED. **Guatemala:** Chejel, 1♂, 1♀. **Guatemala:** Guatemala City, 1♀ (*Rodriguez*). **Izabel:** Cayuga, 1♂. **Alta Verapaz:** Mpio. San Cristobal Verapaz, Mexabaj, 1300 m, 1♂, 29.vii.1981 (*Welling*); Coban, 1200 m, 1♂, 31.vii.1981 (*Welling*). **Nicaragua:** *Zelaya:* Eden,

14°0'N 84°26'W, 1♀, 28.v.1922 (*Wharton Huber*). **Costa Rica:** Recu de Janson, 1♂, 1♀, iv.1924. **Alajuela:** Rio San Lorencito, Reserve Forestal de San Ramon, 5 km North Col. Palmarena, 800 m, 1♂, xi.1986 (*Chacon*). **Cartago:** Moravia de Chirripo, 100 m, 1♀; Tapanti, Rio Grande de Orosi, 1300–1400 m, 9°46' × 83°50', 1♂, 23.i.1985 (*Janzen, Hallwachs*); Moravia de Chirripo, 1000 m, 1♀, 10.v.1983 (*Janzen, Hallwachs*); Sitio, 1♀; Cachi, 1♀, 23.v.17; Juan Vinas, 1♂ [lectotype of *eminens*] vi. (*Schaus*); 1100 m, 1♂ [paralectotype of *eminens*]; 760 m, ii.1911 (*Schaus*); v.1911, 1♀ (*Schaus*); 1♂ [lectotype of *eminens*]; 3♂ (*Schaus*); 1♂, i. (*Schaus*); Juan Vinas, 1♂, xi; 1♂ [paralectotype of *eminens*] (*Schaus*). **Cartago:** Sitio, 1♂, v. **Heredia:** La Selva Biological Station, Puerto Viejo de Sarapiquí, 40 m, 1♂, 1♀, iii.1986 (*Chavarria*); 1♂, ix.1987 (*Chavarria*); 2♂, ii.1986 (*Chavarria, Chacon*); El Angel waterfall, 1350 m, 8.2 km downhill Vara Blanca, 1♂, 3.i.1981 (*Janzen, Hallwachs*); 1♂, 22.iv.1984 (*Janzen, Hallwachs*). **Limon:** Cuatro Esquinas, Parque Nacional Tortuguero, 0 m, 1♂, set 1989 (*Solano*); 1♀, iv.1989 (*Aguillar, Solano*); Cerro Tortuguero, Parque Nacional Tortuguero, 0–100 m, 1♀, 30.v.1984 (*Janzen, Hallwachs*); 100 m, 1♂, x.1989 (*Solano*); 100 m, 1♂, iv.1989 (*Aguillar, Solano*); Guapiles, 1♂. **Puntarenas:** Fila Esquinas, 35 km South of Palmar Norte, 150 m, 8°45' × 83°20', 2♂, 1♀, 7–8.i.1983 (*Janzen, Hallwachs*). **San Jose:** Estacion Carrillo, Parque Nacional Braulio Carrillo, 700 m, 1♀, vii.1984 (*Chacon*); 1♂, x.1984 (*Chacon*); 1♀, ix.1984 (*Chacon*); 1♂, iii.1985 (*Chacon*); 2♂, vi.1985 (*Chacon*); La Montura, Braulio Carrillo National Park, 1100 m, 3♂, 17.xii.1981 (*Janzen, Hallwachs*); Estacion Bijagual, 500 m, Reserve Biologica Carara, 1♂, xi.1989 (*Zuniga*); Carrillo, 1♀; La Fuente, Turrialba, 3♂. **Osa Peninsula:** Corcovado National Park, 1♂, 13–22.iii.1980 (*Janzen, Hallwachs*). **Venezuela:** Hotel La Mantana, La Grita, Tachira, 2040 m, 1♀. San Esteban, 3♂, vi.1909 (*Klages*). **Aragua:** Rancho Grande, 1100 m, 2♂, 2♀; 1♂, 22–23.vi.1984 (*Covell*); 1♂, 12.vii–16.viii.1976 (*Watson*); 1♂, 14.vii.1975 (*Pliske*); Rancho Grande, 1♂, 24.iv.1946 (*New York Zoological Society*). **Bolivar:** Ptari-tepui, 1♂. **Merida:** Merida, 1630 m, 1♂ [lectotype of *concinna*] 1897 (*Briceno*); 1♂, iv.99 (*Briceno*); 4♂ [paralectotypes of *concinna*] (*Briceno*); 4♂, 1♀ (*Briceno*); Merida: 7 ♂, 1♀. **Carabobo:** Las Quignas, Esteban Valley: 1♂, xi–iii.10; 2♂, 1914; 1♂ (*Klages*); 2♂, vi.19 (*Klages*); 1♂, 2♀. **Colombia:** **Cundinamarca:** La Mesa, 1200 m, 1♂, v–vi.1920 (*Hall*); Finca San Pablo, 3km N of Alban, 1800 m, 1♂ 1–12.viii.1967 (*Wygodzin-*



sky, Wygodzinsky). *Meta*: Upper Rio Negro, 800 m, 1♂ (*Fassl*). *Narino*: West Colombia, Altaquer, 500 m, 1♀, iii–vi.1927. *Antioquia*: Mesopotamia, 1500 m, 2♂ 1♀ [no date]. *Valle*: Anchicaya, Valle, 910 m, 2♂, 29.vi.1981 (*Sullivan*). *Ecuador*: *Napo*: 69 km NE Baeza, 15 km SW Reventador, near San Rafael Falls, 1400 m, 1♂, 1♀, 29.x.1988 (*Miller*). *Peru*: *Cajamarca*: River Tabaconas, North Peru, 1800 m, 3♂, 1♀, 1912 (*Pratt, Pratt*); Charapo River, Tabaconas, 1200 m, 1♂, 1912 (*Pratt*); 180 m, 1♂, 1912 (*Pratt, Pratt*). *Junin*: Utcuyacu, 1500 m, 1♂, xii.ii.1920 (*Watkins*). *Puno*: La Oroya, Rio Inambari, S.E Peru, 940 m, 1♂, 1♀, dry season, ix.1904 (*Ockenden*); 3♂, 1♀, wet season, iii.05 (*Ockenden*); 1♂, v.1905 (*Ockenden*); San Gaban, 760 m, 2♂, iii–iv.1913; Oconeque, 2100 m, 1♂, ii.1905 (*Ockenden*); 1♂, dry season, vii.1904 (*Ockenden*); 3♂, ii.1905 (*Ockenden*); Santo Domingo: 1800 m, 1♂, wet season, xi.01 (*Ockenden*); 1400 m, 1♂, dry season, vi.02 (*Ockenden*); 1800 m, 2♀, dry season, vi.02 (*Ockenden*); 1♂, 1♀, dry season, vii.02 (*Ockenden*); 2000 m, 1♀, viii.02 (*Ockenden*); 1♂, xi.1904 (*Ockenden*); Tinguri, 1000 m, 1♂, wet season, i.1905 (*Ockenden*); Quinton, 1500 m, 2♂, 1905 (*Ockenden*). *Cuzco*: 1♂, i.1952 (*Waylkowski*); Paneartambo, Coosnipata, 3♂, 14.26.xi.1951, 2.xii.1951 (*Woytkowski*). *Bolivia*: *La Paz*: Chulumani, 2000 m, 2♂, wet season, 1.i (*Simons*); Rio Songo, 3♂; El Choro, Yungas de La Paz, 900 m, 1♂, 7–8.i.1976 (*Pena*). *Chukisaca*: Incahuasi, E. Muyupampa, 1600 m, 1♂, 21–24.xii.1984. *Brazil*: *Espirito Santo*: 4♂, 1♀; 1♀ (*Smith*); Campo Bello, Rio Zikan, 3♂. *Amazonas*: Fonte Boa, 1♀, vii.1906 (*Klages*); Hyntanahan, Rio Purus, 1♂, ii.1922 (*Klages*); 1♀, iv.1922 (*Klages*). *Rio de Janeiro* Zikau, Itatiaia, 1♀ [lectotype of *albicoma matura*] 8.iv.24 (*Zicht*). *Santa Catarina*: Jaragua do Sul, 1♂, ix.1932 (*Hoffmann*); 1♂, xii.1933 (*Hoffmann*); 1♂, xii.1934 (*Hoffmann*); Rio Laeiss, Blumenau, 3♂, xii.1933 (*Hoffmann*). *Sao Paulo*: Alto da Serra, 800 m, 1♀ (*Jones*); 1♂, 3.xii.1912 (*Jones*); Alto da Serra, Sao Paulo, 1♂, xi.1922 (*Spitz*); 2♂, i.1923 (*Spitz*); 1♂, xii.1923 (*Spitz*); 1♀, iii.1924 (*Spitz*); 1♀, xii.1924 (*Spitz*); 1♀, ii.1928 (*Spitz*); Serra do Mar, 1♀ (*Wucherpfennig*); Boraceia, 1♂, 3.xi.1984 (*Ebert*); Salesopolis, 1♂, 27.iii.1944 (*Pearson*); Salesopolis, Boraceia, 800 m, 1♂, 21–25.x.1963 (*Oliveira, Wygodzinsky*); Salesopolis, 850 m, 1♀, 5.x.1948 (*Filho, Pearson*). *Localities unknown*: 1♂, 1♀.

*Depositories*: AMNH, BMNH, CMNH, INBio, USNM, UCVN.

## *Oospila dicraspeda* Prout

(Figs 42, 115, 171)

*Oospila dicraspeda* Prout, 1932: 56. LECTO-TYPE ♂, here designated, in BMNH. Type locality: BRAZIL. Label data: Type; Brésil Prov[ince]. Mato Grosso. P. Germain 1886; Ex. Oberthür Coll[ection] Brit[ish] Mus[eum] 1927–3; *Oospila dicraspeda* ♂ Prout type; Geometridae genitalia slide No. 15705♂. [Examined.]

♂, ♀ (Fig. 42). Fore wing length 9–10 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches very small and marginal, cream heavily irrorated with brown. Fore wing: costa pale brown; subapical blotch, connected to blotch at tornus by band along termen; blotch at tornus; discal spot small, brown. Hind wing: blotches at apex and tornus, connected by band along termen; blotch at anal margin absent; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male without brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of A2 and A3 of male; sternum A8 strongly sclerotized in male with bifurcate apical extension.

GENITALIA ♂ (Fig. 115). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; ampulla absent; sacculus extended into large, pointed projection. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: with two large carinae; vesica with small cornutus.

GENITALIA ♀ (Fig. 171). Ostium: sterigma approximately triangular. Bursa copulatrix: ductus bursae long, antrum long; strongly sclerotized, and striated below antrum; corpus bursae large, approximately spherical; signum small. Anterior apophyses short.

DIAGNOSIS. *Oospila dicraspeda* differs from *confluaria* by the absence of a brown discal spot on the hind wings (compare Figs 42 and 47). Males can be further distinguished by the absence of a brush of long hair-like scales on the hind tibia and the absence of an ampulla in the genitalia (compare Figs 115 and 120). Females may be distinguished by the shape of the sterigma (compare Figs 171 and 175). The presence of

small blotches at, or posterior to, the apex and tornus of the fore and hind wings distinguish *dicraspeda* from *pellucida* (compare Figs 42 and 68).

**DISTRIBUTION.** Specimens were examined from Costa Rica, Trinidad, Peru and Brazil.

**MATERIAL EXAMINED.** **Costa Rica:** *Guanacaste:* Casa Oeste, Cerro El Hacha, 12 km South East La Cruz, 300 m, 1♂, i.1988 (*Chacon*); Santa Rosa National Park, 1♀, 2–11.iii.1980 (*Janzen, Hallwachs*); 1♂, 9–11.v.1980 (*Janzen, Hallwachs*); 1♂, 8–10.vi.1980 (*Janzen, Hallwachs*); 2♂, 1–15.i.1982 (*Janzen, Hallwachs*); 1♀, 10–20.iii.1982 (*Janzen, Hallwachs*); 2♂, 1♀, xii.1982 (*Janzen, Hallwachs*); 300 m, 4♂, 6♀, i.1983 (*Janzen, Hallwachs*); 1♂, 30.vi.1983 (*Janzen, Hallwachs*); 1♂, i.1984 (*Janzen, Hallwachs*); 4 km E Casetilla, Rincon National Park, 750 m elevation, 1♂, 11.iv.1983 (*Janzen, Hallwachs*). **Trinidad:** 1♀ (*Buchholz*). **Peru:** 1♂ (*Mathan*). **Brazil:** *Mato Grosso:* 1♂ [lectotype] 1886 (*Germain*); 7♂ [paralectotypes].

*Depositories:* AMNH, BMNH, INBio.

### *Oospila ciliaria* (Hübner)

(Pl. 1: 12, Figs 43, 116, 172)

[*Phalaena Geometra marginaria* Stoll [1787–1790]: 156, pl. 34, fig. 8. Homonym of *marginaria* Fabricius; Prout, 1912: 133.]

[*Phalaena marginaria* (Stoll); Verloren, 1837: 269.]

[*Comibaena* (?) *marginaria* (Stoll); Walker, 1861: 570.]

*Eucrostes ciliaria* Hübner, 1823: 283. Holotype: not traced. [Not examined.]

*Oospila ciliaria* (Hübner); Prout, 1912: 133; 1932: 56.

*Phorodesma* ? *semialbaria* Guenée, 1857: 372. Holotype: sex and depository unknown. Type locality: Brazil. [Not examined.] Synonymized with *Oospila ciliaria* (Hübner) by Guenée, 1857: 372.

*Racheolopha pallida* Warren, 1906: 426. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. French Guiana: Maroni R[iver], Saint Jean, viii.1904; Schaus coll[ection]; Type No. 9198 U.S.N.M.; Genitalia Slide By MAC 57726 USNM. [Examined.] **Syn.n.**

*Oospila pallida* (Warren); Prout, 1912: 133.

*Oospila ciliaria pallida* (Warren); Prout, 1932: 56.

♂, ♀ (Pl. 1: 12; Fig. 43). Fore wing length 12–15 mm. Antenna of female bipectinate. Frons and vertex red. Interantennal fillet white. Thorax:

dorsal surface pale green. Wings: very pale green with a slight bluish tinge; blotches absent. Fore wing: margin of termen brick red; discal spot minute, faint and brown. Hind wing: as fore wing. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales; sternum A3 of male with deciduous setae (unusually for genus); elliptical sclerite present on intersegmental membrane between sterna A2 and A3 of male; sternum A8 with emarginated posterior edge in male.

**GENITALIA** ♂ (Fig. 116). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; narrow; ampulla short, denticulate at apex; sacculus extended into short, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate usually V-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 172). Ostium: sterigma absent. Bursa copulatrix: ductus bursae long, strongly sclerotized and striated, antrum indistinct; corpus bursae medium sized, approximately spherical; signum quite large. Anterior apophyses short.

**DIAGNOSIS.** The very pale colour of the wings makes this species easy to distinguish from all others in the genus.

**DISTRIBUTION.** Known only from the North West of South America, this species has been collected in French Guiana, Guyana and Brazil.

**MATERIAL EXAMINED.** **Brazil:** *Amazonas:* Fonte Boa, 1♂, vii.1906 (*Klages*). **French Guiana:** *Guyane:* St. Jean du Maroni, 1♂ [holotype of *pallida*]; 1♂, vii (*Le Moult*); 5♂, 1♀ (*Le Moult*); 2♂; Mana River, 1♀, v.1917. **Guyana:** *Mazaruni-Potaro:* Kartabo, Bartica District, 1♂; Omai, 2♂, vi.1908 (*Klages*); Potaro, 4♂, ii.1908 (*Klages*); 3♂, v.1908 (*Klages*); Potaro, 1♀; Tumatumari, 1♂, ii.1907 (*Klages*); 1♂ ii.1908 (*Klages*).

*Depositories:* BMNH, USNM.

### The *trilunaria* group

The monophyly of the *trilunaria* group is established on the form of the anellar complex. The transtillae are short arms, fused posteriorly with the anellar complex. The basal part of the anellar complex is long, usually with a short dorsal projection; this projection lies at right angles to



the plane illustrated. Two subgroups, *marginata* and its relatives and *atopochlora* and its relatives, occur within the *trilunaria* group.

### *Oospila trilunaria* (Guenée)

(Figs 44, 117, 173)

*Phorodesma trilunaria* Guenée, 1857: 372. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: B[rasil]; Ex Musaeo Ach Guenée; Typicum Specimen; *Phorodesma trilunaria* Guenée. Sp. G. no 594. type; 3238; Ex Oberthür Coll[ection] Brit[ish] Mus[eum] 1927-3; Geometridae genitalia slide No. 15756 ♂. [Examined.]

*Comibaena trilunaria* (Guenée); Walker, 1861: 570.

*Oospila trilunaria* (Guenée); Warren, 1897: 426; Prout, 1912: 132; 1932: 56.

♂, ♀ (Fig. 44). Fore wing length 15–22 mm. Antenna of female bipectinate. Frons green, vertex green dorsally, cream ventrally. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream, with dark brown perimeters and some dark irrorations. Fore wing: costa pale brown; subapical blotch approximately circular, not connected to blotch at tornus; blotch at tornus large, approximately circular; discal spot usually prominent, brown with pale centre. Hind wing: blotch at apex absent; blotch at tornus approximately circular; blotch at anal margin absent; anterior discal spot white; posterior discal spot as in fore wing. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 deeply emarginated in male, with two posterior extensions, serrated on facing margins.

GENITALIA ♂ (Fig. 117). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla broad and flattish, robust, with denticulate apex; sacculus lobed. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate weakly emarginated. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀ (Fig. 173). Ostium surrounded by ring-like sterigma. Bursa copulatrix: ductus bursae relatively broad and long, antrum short, narrow, strongly sclerotized, not striated below antrum; corpus bursae large; signum large. Anterior apophyses short.

DIAGNOSIS. *Oospila trilunaria* can be distinguished by the circular wing blotches and the position of these blotches (Fig. 44). The male genitalia of *trilunaria* can be recognised by the shape of the ampulla (Fig. 117). Sternum A8 of the male is also distinctive.

DISTRIBUTION. Known only from Brazil.

REMARK. *O. trilunaria* is the type species of the genus.

MATERIAL EXAMINED. **Brazil:** Friburgo, 1♀. 1♂ [holotype]. Campo Bello, Rio Zilcan, 4♂, 1♀. Rio, 1?. **Rio de Janeiro:** Corcovado, 1♀, ii.1910; Rio de Janeiro: 2♂. **Santa Catarina:** Nova Bremen, Rio Laeiss, 1♂, 1♀, iii.1936 (Hoffmann); Nova Bremen, 250 m, 1♂, x.37 (Hoffmann); Blumenau, 1♂, 26.iv.29 (Schade); Rio Vermelho, 850 m, 1♂, iii.37 (Hoffmann); 1♂, iv.37 (Hoffmann).

Depositories: BMNH, USNM.

### *Oospila carnelunata* (Warren)

(Figs 45, 77, 118, 174)

*Racheolopha carnelunata* Warren, 1906: 421. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: S[ain]t Jean, Maroni, F[rench] Guiana; *Racheolopha carnelunata* type ♂; Type No. 9187 U.S.N.M.; Collection Wm Schaus; Genitalia Slide By MAC 57756 USNM. [Examined.]

*Oospila carnelunata* (Warren); Prout, 1932: 56.

♂, ♀ (Fig. 45, 77). Fore wing length 11–18 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: pattern varies greatly; ground colour dark green; blotches cream, with dark brown perimeters and irroration. Fore wing: costa pale brown; subapical blotch connected to blotch at tornus by brown line along termen; blotch at tornus small; discal spot small, brown. Hind wing: blotch at apex usually extending along 2/3 of termen, usually darker at anterior; occasionally reduced to very narrow band along termen, usually connected to blotch at tornus by brown line along termen; blotch at tornus small; blotch along anal margin absent; anterior discal spot small, white; posterior discal spot small, brown, usually very faint, sometimes quite large and dark. Hind leg: proximal spurs absent; brush of long hair-like scales present on male tibia. Abdomen: basal crests dark brown, distal crests paler; with cream area around crests enclosed by thin pink line, remainder of dorsal surface green; sternum A2 with

brushes of long hair-scales and elliptical sclerite at posterior present in male; sternum A8 strongly sclerotized in male, with bifurcate posterior extension.

**GENITALIA ♂** (Fig. 118). Uncus short, blunt. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla narrow, with short, subapical process; sacculus lobed and extended into a short pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: cornutus with strongly developed carina and large apical cornutus.

**GENITALIA ♀** (Fig. 174). Ostium: sterigma with two short, stubby, posteriorly directed pockets. Bursa copulatrix: ductus bursae short, weakly sclerotized, not striated, antrum short; corpus bursae large; signum quite large. Anterior apophyses absent.

**DIAGNOSIS.** This species can usually be distinguished from *marginata*, *obsolescens* and *tricamerala* by the extension of the hind wing apical blotch in *carnelunata* (compare Pl. 1: 16, Figs 45, 54, 55 and 56). However, in some specimens of *carnelunata*, this blotch is reduced and the genitalia are the only reliable guide. The male genitalia of *carnelunata* can be recognised by the shape of the ampulla (compare Figs 118, 126, 127 and 128). The female genitalia can be recognised by the distinctive arrangement of pockets surrounding the ostium and by the absence of anterior apophyses (compare Figs 174, 181, 182 and 183). *Oospila carnelunata* can be distinguished from *confluaria* by the paler colour of its markings (compare Figs 45 and 47).

**DISTRIBUTION.** Material was examined from French Guiana, Surinam, Venezuela, Peru, Bolivia and Brazil.

**REMARK.** A specimen of *carnelunata* in the BMNH collection was labelled by Prout as the type of *Oospila vetita*, but the name was never published.

**MATERIAL EXAMINED.** **French Guiana:** Guyane: St. Jean du Maroni, 1♂ [holotype]. **Surinam:** Geldersland, Surinam River, 1♀. **Venezuela:** 1♀. **Peru:** Loreto: Lago Yarina-Cocha, Loreto, 1♂. **Bolivia:** Rio Songo, 750 m, 1♂. **Brazil:** Amazonas: Fonte Boa, 1♂, ix.06 (Klages).

*Depositories:* BMNH, USNM.

## *Oospila altonaria* Jones

(Figs 46, 119)

*Oospila altonaria* Jones, 1921: 349; Prout, 1932: 56. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; Alto da Serra Santos 800 m. 10 Mar[ch] 1913 E.D. Jones; *Oospila altonaria* Type ♂ D. Jones; E.D. Jones Coll[ection] Brit[ish] Mus[eum] 1919-295; Geometridae genitalia slide No. 15706 ♂. [Examined.]

♂ (Fig. 46). Fore wing length 14–16 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: dark green; blotches absent; margin of termen and tornus red-brown with white fringe. Fore wing: costa pale brown; prominent, brown discal spot with pale centre. Hind wing: as in fore wing, but also with small, white anterior discal spot. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler, cream area around crests enclosed by pink line, remainder of dorsal surface green; lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 strongly sclerotized, with bifurcate apical extension.

**GENITALIA ♂** (Fig. 119). Uncus short, blunt. Socii large. Gnathos: not fused, not reduced. Valva: cleft; costal margin bearing a pointed projection at base; ampulla short, robust, with denticulate apex; sacculus extended into short, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum with V-shaped ventral plate, with medial extension. Coremata absent. Aedeagus: vesica with small cornutus.

**GENITALIA ♀.** Unknown.

**DIAGNOSIS.** *O. altonaria* can be distinguished from other species by the combination of the presence of large, brown discal spots on the fore wing and the hind wing and absence of other conspicuous markings (Fig. 46). The male genitalia of *altonaria* can be recognised by the pointed extension of the base of the costal edge of the valva and by the shape of the ampulla (Fig. 119).

**DISTRIBUTION.** Known only from the Sao Paulo province of Brazil.

**MATERIAL EXAMINED.** **Brazil:** Sao Paulo: Alto da Serra, Santos, 800 m, 1♂ [holotype] 10.iii.1913 (Jones); 2♂, xi.1922 (Spitz); 1♂, 31.viii.24 (Spitz); Baracca, 1♂, 4.x.1948 (Pearson).



*Depository:* AMNH, BMNH.

***Oospila confluaria* (Warren)**

(Figs 47, 120, 175)

*Racheolopha confluaria* Warren, 1906: 422.

Holotype ♂, in USNM. Type locality; FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], Saint Jean, iii.1904; Schaus Coll[ection]; Type No. 9189 U.S.N.M.; Genitalia slide by MAC No. 57720. [Examined.]

*Oospila confluaria* (Warren); Prout, 1932: 56.

*Oospila mesocraspeda* Prout, 1912: 134. Holotype ♀, in BMNH. Type locality: PANAMA. Label data: Type; La Choerra. Panama. 1 IV to 15 V 98. C.H. Dolby-Tylor 98-146; *Oospila mesocraspeda* type Prout; Geometridae genitalia slide No. ♀ 15696. [Examined.] **Syn.n.**

*Oospila confluaria mesocraspeda* Prout, 1932: 56.

♂, ♀ (Fig. 47). Fore wing length 11–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches dark brown, with paler centres. Fore wing: costa pale brown; subapical blotch small, connected to apex and to blotch at tornus by band along termen; blotch at tornus small; discal spot small, brown. Hind wing: blotch at apex narrow, connected to blotch at tornus by band along termen, blotch at tornus small; blotch at anal margin absent; anterior discal spot small, white; posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales present on male tibia. Abdomen: basal crests dark brown, distal crests paler; with pink area around crests, remainder of dorsal surface green or cream; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 present in male; sternum A8 of male strongly sclerotized, with bifurcate posterior extension.

GENITALIA ♂ (Fig. 120). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla long, narrow, digitate; sacculus lobed and extended into short process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with large cornutus.

GENITALIA ♀ (Fig. 175). Ostium: sterigma distinctive (Fig. 175). Bursa copulatrix: ductus bursae with large, wide, strongly sclerotized antrum, and striated below antrum; corpus bursae large;

signum small. Anterior apophyses short.

DIAGNOSIS. *Oospila confluaria* can be distinguished from *sellifera* by its much narrower brown band along the termen, especially in the hind wings (compare Figs 47 and 49). Females can be distinguished from *sellifera* by the antennae which are bipectinate in *confluaria* but not bipectinate in *sellifera*.

The presence of a brown discal spot on the hind wings distinguishes *confluaria* from *dicraspeda* (compare Figs 42 and 47). Males can also be distinguished by the presence of a brush of long hair-like scales on the hind tibia of *confluaria*.

The expansion of the brown markings into blotches distinguishes *confluaria* from *pellucida* (compare Figs 47 and 68), and the uniformly dark colour of the markings distinguishes *confluaria* from *carnelunata* (compare Figs 45 and 47).

The female genitalia of *confluaria* can be recognised by the distinctive shape of the sterigma (Fig. 175).

DISTRIBUTION. Specimens were examined from Costa Rica, Panama, French Guiana, Surinam, Guyana, Colombia and Brazil.

REMARK. One of the specimens in the USNM bears a printed label with 'Orizaba, Mex' and a handwritten label with 'S[ain]t Jean, FRENCH GUIANA'. Since only one other species of *Oospila* occurs in Mexico and there have been no other records of *confluaria* occurring north of Costa Rica, the validity of the Mexican record seems doubtful.

MATERIAL EXAMINED. **Costa Rica:** 1♂, 2♀. *Guanacaste:* 4 km West Santa Cecilia, 250 m, 1♂, 25.ii.1985 (Janzen, Hallwachs). **Panama:** La Chorrera, 1♀ [holotype of *mesocraspeda*] 1.iv–15.v.98 (Dolby-Tylor). **Canal Zone:** Barro Colorado Island, 1♀. **French Guiana:** *Guyane:* St. Jean du Maroni, 1♂, v. (*Le Moult*); 6♂, 1♀ (*Le Moult*); St. Jean du Maroni, 1♂ [holotype of *confluaria*] iii.1904; 3♂, 2♀; St. Laurent du Maroni, 1♀; Maroni River, 1♂. 1♂, 1916 (Knudsen). **Surinam:** *Marowijne:* Aroewarwa Creek, Maroewym Valley, 1♂, v.05 (*Klages*). **Guyana:** *Mazaruni-Potaro:* Potaro, 1♀, ii.1908 (*Klages*). **Colombia:** *Meta:* Upper Rio Negro, 800 m, 1♀ (*Fassl*). **Brazil:** *Amapa:* Para, 1♂ (*Moss*).

*Depositories:* BMNH, INBio, USNM.

*Oospila longipalpis* (Warren)

(Figs 48, 121, 176)

*Racheolopha longipalpis* Warren, 1906: 425.

Holotype ♀, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean; Schaus Coll; Type No. 9196 U.S.N.M. [Examined.]

*Oospila longipalpis* (Warren); Prout, 1912: 134; 1932: 55.

♂, ♀ (Fig. 48). Fore wing length 13–20 mm. Antenna of female unknown. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green in fresh specimens, very pale in BMNH specimen; blotches absent; markings dark brown. Fore wing: weakly falcate; costa pale brown; band along termen broad at tornus, narrowing to apex and not extending to costa; discal spot very small, dark brown. Hind wing: band along termen, broadest at apex and tornus; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 in male present; sternum A8 strongly sclerotized in male, with bifurcate posterior extension.

GENITALIA ♂ (Fig. 121). Uncus very short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, forked at apex; sacculus with very short, pointed extension. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate U-shaped with medial projection. Coremata absent. Aedeagus: vesica with short cornutus.

GENITALIA ♀ (Fig. 176). Ostium: sterigma square. Bursa copulatrix: ductus bursae long, narrow, strongly sclerotized, striated along most of its length, antrum present; corpus bursae quite small; signum large. Anterior apophyses short.

DIAGNOSIS. *Oospila longipalpis* can be distinguished from *sellifera* by the shape of the brown markings (compare Figs 48 and 49) and by the absence of a brown discal spot on the hind wings. The shape of the fore wing is also distinctive within the genus. The absence of white speckling within the brown markings distinguishes *longipalpis* from *lilacina* (compare Pl. 1: 13, Figs 48, 50). The male genitalia of *longipalpis* can be recognised by the shape of the ampulla (Fig. 121).

DISTRIBUTION. Known only from two specimens, both from French Guiana.

MATERIAL EXAMINED. **French Guiana:** 1♂; *Guyane:* St. Jean du Maroni, 1♀ [holotype].

*Depositories:* BMNH, USNM.

*Oospila sellifera* Warren

(Figs 49, 122, 177)

*Oospila sellifera* Warren, 1906: 420; Prout, 1912:

134; 1932: 55. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean, vii.1904; Schaus Coll[ection]; Type No. 9186 U.S.N.M. [Examined.]

♂, ♀ (Fig. 49). Fore wing length 10–13 mm. Antenna of female simple. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings dark brown. Fore wing: costa pale brown; subapical blotch large, merging with blotch at tornus via broad band along termen; blotch at tornus large, extending half length of anal margin; discal spot small, brown. Hind wing: blotch at apex large, merging with blotch at tornus via broad band along termen; blotch at tornus large, extending approximately half length of anal margin; blotch at anal margin small, narrow; anterior discal spot small, white; posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; white area around crests pink at margin; pink or white spot sometimes present anterior of crests; remainder of dorsal surface green; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 present in male; sternum A8 of male strongly sclerotized, bifurcate.

GENITALIA ♂ (Fig. 122). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla deeply forked; sacculus extended into pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate hardly emarginated. Coremata absent. Aedeagus: vesica with short cornutus.

GENITALIA ♀ (Fig. 177). Ostium: sterigma complex (see Fig. 177). Bursa copulatrix: ductus bursae long and broad, with antrum indistinct, strongly sclerotized and striated; corpus bursae marginally wider than ductus; signum quite large. Anterior apophyses relatively long.

DIAGNOSIS. *Oospila sellifera* lacks the extensive



white scaling within the dark wing blotches found in *lilacina* (compare Pl. 1: 13, Figs 49, 50). The presence of a single discal spot on the hind wings of *sellifera*, and the simple antennae of the females also distinguish these two species.

Whereas the brown hind wing markings of *sellifera* are demarcated, in *violacea* the brown colour is diffuse and not demarcated (compare Pl. 1: 14, Figs 49 and 51).

The male genitalia of *sellifera* can be recognised by the presence of the divided ampulla on each valva (Fig. 122). The female genitalia can be recognised by the shape of the sterigma (Fig. 177).

**DISTRIBUTION.** Material was examined from French Guiana, Guyana, Venezuela, Peru and Brazil.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: St. Jean du Maroni, 1♂, 1♀ (*Le Moul*); St. Jean du Maroni, 1♂ [holotype]; 1♀. **Guyana:** 1♂. **Venezuela:** Rio Baria, 140 m, 0°55'N 66°10'W, 1♂, 25.xii.xi-4.1984 (*Osuna, Chacon*); Cerro de la Neblina, Basecamp, 4♂, 3♀. **Amazonas:** San Carlos de Rio Negro, 125 m, 1♂, 19-31.viii.1976 (*Salcedo, Fernandez*). **Lara:** Guarico, Hato Masaguaral, 45 km South of Calabozo, 1♂. **Peru:** *Loreto*: Contamana, Rio Ucayali, 2♂, x-xii.1912. **Brazil:** *Amapa*: Para: Cachimbo, Altitude 400 m, 1♀, 13/20.vii.55 (*Travossos, Olivera, Pearson*). *Distrito Federal*: Planaltina, 15°35'S 47°42'W, 1000 m, 1♀, 25.ix.1985, 1♀. *Goiás*: Formosa, Goiás, 800 m, 1♂, 15.x.1976. *Para*: Unt. Amaz. Taperinha, below Santarem, 1♂, 21-31.vii.27 (*Zerny*).

**Depositories:** BMNH, USNM, UCV, VOB.

### *Oospila lilacina* (Warren)

(Pl. 1: 13, Figs 50, 123, 178)

*Racheolopha lilacina* Warren, 1906: 424. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean, vii. 1904; Schaus Coll[ection]; Type No. 9195 U.S.N.M. [Examined.]

*Oospila lilacina* (Warren); Prout, 1912: 134; 1932: 55.

♂, ♀ (Pl. 1: 13, Fig. 50). Fore wing length 14-22 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings purplish brown with extensive white scaling. Fore wing: costa pale brown; subapical blotch large, connected to blotch at

tornus by broad band along termen; blotch at tornus large, running 2/3 distance along anal margin (Pl. 1: 19); discal spot small, brown. Hind wing: blotch at apex large, connected to blotch at tornus by broad band along termen; blotch at tornus large, extending half length of anal margin; independent blotch at anal margin absent; wing base white; anterior discal spot small, white; posterior discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales present on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream or green; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 present in male; sternum A8 of male strongly sclerotized, bifid, with each process rounded at apex.

**GENITALIA** ♂ (Fig. 123). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla extending just beyond edge of valva, apex broad and denticulate; sacculus extended into short, pointed projection. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate almost V-shaped. Coremata absent. Aedeagus: vesica lacking cornutus.

**GENITALIA** ♀ (Fig. 178). Ostium: sterigma approximately rectangular. Bursa copulatrix: ductus bursae with short, cone-shaped antrum, strongly sclerotized and striated below antrum; corpus bursae approximately spherical; signum small. Anterior apophyses short.

**DIAGNOSIS.** *Oospila lilacina* can be distinguished from *longipalpis*, *sellifera* and *violacea* by the presence of extensive white scaling within the brown wing markings (compare Pl. 1: 13 and 14 and Figs 48-51). *Oospila lilacina* also has two white discal spots on the hind wing, whereas *sellifera* only has one. *Oospila lilacina* is larger than *violacea* and has more extensive brown areas. The female genitalia of *lilacina* can be recognised by the shape of the sterigma (Fig. 178).

**DISTRIBUTION.** Specimens were examined from Guatemala, Nicaragua, Costa Rica, French Guiana, and Brazil.

**MATERIAL EXAMINED.** **Guatemala:** 2♂, 1♀. **Nicaragua:** *Zelaya*: Eden, 14°0'N 84°26'W, 1♂, 24.iii.1922 (*Wharton-Huber*), Eden, 14°0'N 84°26'W, 1♀, 13.x.1922 (*McKenzie*). **Costa Rica:** 3♂, 4♀. *Alajuela*: Finca Campana, 5 km North West Dos Rios, 750 m, 1♂, 21.iii.1985 (*Janzen, Hallwachs*). Finca San Gabriel (16 km East North East Quebrada Grande); 650 m, 1♂,

11.ix.1988 (Janzen, Hallwachs). *Guanacaste*: Estacion Pitilla, 700 m, 9 km South of Santa Cecilia, 1♂. *Heredia*: La Selva Biological Station, Puerto Viejo de Sarapiquí, 1♂, iv.1987 (Chavarría). *Puntarenas*: Fila Esquinas, 35 km South of Palmar Norte, 150 m elevation, 8°45' × 83°20', 3♀, 7–8.i.1983 (Janzen, Hallwachs); 2♂ (Janzen, Hallwachs). *San Jose*: Estacion Carrillo, Parque Nacional Braulio Carrillo, 700 m, 1♀, ix.1984 (Chacon); 1♂. **French Guiana**: *Guyane*: St. Jean du Maroni, 1♂ [holotype]; 2♂, ix. (*Le Moult*); 1♂. Nouveau Chantier, 2♂ (*Le Moult*); 2♂. **Brazil**: *Amazonas*: Nova Olinda, Rio Purus, 1♂, v.1922 (Klages).

*Depositories*: AMNH, BMNH, CMNH, INBio, USNM.

### *Oospila violacea* Warren

(Pl. 1: 14, Figs 51, 124, 179)

*Oospila violacea* Warren, 1897: 427; Prout, 1912: 133. Holotype ♀, in BMNH. Type locality: GUYANA. Label data: Type; Rio Demerara; Rothschild Bequest B[ritish] M[useum] 1939-I; *Oospila violacea* type ♀ Warren; Geometridae genitalia slide No. 15709 ♀. [Examined.]

♂, ♀ (Pl. 1: 14, Fig. 51). Fore wing length 13–15 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green in fresh specimens, but rapidly fading to pale yellow-green. Fore wing: costa pale brown; subapical blotch small, linked to blotch at tornus by distinctive white line along termen; blotch at tornus small; discal spot small, brown. Hind wing: purplish brown on distal half to two thirds, green on basal half to one third area; anterior discal spot small, white; posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface brown; sternum A2 in male with brushes of long hair-scales present; elliptical sclerite present on intersegmental membrane between sterna A2 and A3 in male; sternum A8 strongly sclerotized and bifid in male.

**GENITALIA** ♂ (Fig. 124). Uncus reduced. Socii reduced. Gnathos: not fused, not reduced. Valva: cleft; ampulla long, narrow, digitate, with apex denticulate; sacculus extended into robust process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped, with short ventral projection. Coremata absent.

**Aedeagus**: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 179). Ostium: sterigma large, rectangular, complex. Bursa copulatrix: ductus bursae long, with large antrum, strongly sclerotized and striated below antrum; corpus bursae large; signum small. Anterior apophyses short.

**DIAGNOSIS**. *Oospila violacea* lacks the extensive white scaling in the wing blotches of *lilacina* (compare Pl. 1: 13 and 14, Figs 50 and 51). The absence of distinct blotches on the hind wings and the more diffuse purplish brown markings distinguish *violacea* from *sellifera* (compare Pl. 1: 14, Figs 49 and 51). The female genitalia of *violacea* can be recognised by the shape of the sterigma (Fig. 179).

**DISTRIBUTION**. This species has been collected in French Guiana, Surinam, Guyana, Peru, Bolivia and Brazil.

**MATERIAL EXAMINED**. **French Guiana**: *Guyane*: St. Laurent du Maroni, vi.1915, 1♂. St. Jean du Maroni, 8♂, 7♀; 2♂, 3♀ (*Le Moult*); 1♀, vi. (*Le Moult*); 2♀, 1?, ii. (*Le Moult*); 1♂, x. (*Le Moult*); Nouveau Chantier, 1♂, vii. (*Le Moult*); 1♀. **Surinam**: *Marowijne*: Aroewarwa Creek, Maroewym valley, 1♀, vii.1905 (*Klages*). **Guyana**: *Mazaruni-Potaro*: Essequibo River, Moraballi Creek, 1♀, 28.vii.29 (*Oxford University Expedition*); Potaro River, 1♀, 9–13.vii.1912 (*Rendall*); Tumatumari, Rio Potaro, 1♂ [no date]; Bartica District, Kartabo, 1♀, 28.i.1921; Omai, 1♀; Rockstone, Essequibo, 1♀. *East Demerara-West Coast Berbice*: Demerara River, 1♀ [holotype]; Potaro, 2♂, 2♀, v.1908 (*Klages*). **Peru**: 1♂ (*Mathan*). **Bolivia**: *Cochabamba*: Chapare, 4♂, vii.1950, iv,v.1951; tropical region, Chapare, 400 m, 1♂, 25.viii.1948 (*Foerster*). **Brazil**: Rio Madeira, 1♂. 1♂ (*Germain*). *Amazonas*: Fonte Boa, 1♀, vi.06 (*Klages*); 1♀, vii.06 (*Klages*); 4♀, viii. (*Klages*). *Mato Grosso*: 5♂, 1886 (*Germain*); 4♂ (*Germain*); Burity, 30 miles North East of Cuyaba, 1♂, 16–22.x.27 (*Collenette*). *Puno*: Monte Cristo, Tapajos, 1♂; Nova Olinda, Rio Purus, 2♀, vi.1922 (*Klages*). *Para*: Jacareacanga, 1♀, xii.1968 (*Alvarenga*).

*Depositories*: AMNH, BMNH, USNM.

### *Oospila callicula* (Druce)

(Figs 52, 125, 180)

*Comibaena callicula* Druce, 1892: 88. Holotype ♂, in MNHU. Type locality: PANAMA. Label data: Panama: Chiriqui (Trötsch). [Not examined.]



*Oospila callicula* (Druce); Prout, 1912: 133; 1933: 58.

*Oospila callicula stenobathra* Prout, 1933: 58. Holotype ♂, in BMNH. Type locality: BOLIVIA. Label data: Type; 39. 27. Mutum, 20 miles W[est] of Porto Suarez, 1500 ft, 7-14.xi.27. Bolivia C. L. Collenette; 2982; *Oospila callicula stenobathra* ♂ type Prout; At light; Joicey Bequest. Brit[ish] Mus[eum] 1934-120; Geometridae genitalia slide No. 15692 ♂. [Examined.] **Syn.n.**

*Oospila callicula orchardae* Prout, 1933: 58. Holotype ♀, in BMNH. Type locality: BRAZIL. Label data: Type; Maranhao, N[orth] E[ast] Brazil. (Miss Orchard); Rothschild Bequest B[ritish] M[useum] 1939-1; *Oospila callicula orchardae* ♀ Prout type; Geometridae genitalia slide No. 15693 ♀. [Examined.] **Syn.n.**

♂, ♀ (Fig. 52). Fore wing length 15-17 mm. Antenna of female bipectinate. Frons brown, vertex green. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green, markings cream. Fore wing: costa pale brown; blotch at apex variable in size, never extending to costa, not usually connected to blotch at tornus by band along termen; blotch at tornus quite small; blotch at wing base present in form *orchardae* and absent from form *stenobathra*; discal spot large, mainly white, with brown centre. Hind wing: blotch at apex long, narrow, variable but usually extending along half length of termen; blotch at tornus small; blotch at anal margin often absent, occasionally short, narrow; blotch at wing base usually present (absent in form *stenobathra*); anterior discal spot small, white; posterior discal spot large, white. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales; elliptical sclerite on intersegmental membrane of sterna A2 and A3 present in male; sternum A8 of male strongly sclerotized, bifid, with each process serrated at apical margins.

GENITALIA ♂ (Fig. 125). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, curved, with rounded, denticulate apex; sacculus lobed. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate squarish. Coremata absent. Aedeagus: vesica lacking cornutus.

GENITALIA ♀ (Fig. 180). Ostium: sterigma a bar with each end expanded into a pocket. Bursa

copulatrix: ductus bursae long, quite strongly sclerotized, but not striated, antrum absent, entry point of ductus seminalis expanded and sclerotized; corpus bursae large; signum large. Anterior apophyses short.

DIAGNOSIS. *Oospila callicula* can be distinguished from other species with cream markings by size and shape of the discal spot in the fore wing (Fig. 52). The genitalia of *callicula* (Figs 125 and 180) are indistinguishable from those of *obeliscata*, but the wing markings are quite distinct (compare Figs 52 and 53). The male genitalia of *callicula* (and *obeliscata*) can be recognised by the distinctive form of the ampulla (Fig. 125). The female genitalia can be recognised by the distinctive form of the sterigma and by the expansion of the ductus bursae at the entry point of the ductus seminalis (Fig. 180).

DISTRIBUTION. This species is known only from Bolivia and Brazil.

MATERIAL EXAMINED. **Bolivia:** Santa Cruz: Mutum, 20 miles West of Puerto Suarez, 460 m, 1♂ [holotype of *callicula stenobathra*] 7-14.xi.27 (Collenette). **Brazil:** Gioas: Maranhao, North East Brazil, 1♀ [holotype of *callicula orchardae*] (Orchard). Mato Grosso: Urucum, 15 miles South of Corumba, 200 m, 1♂ [paratype of *callicula stenobathra*] 26.iv.27 (Collenette); 1♂ (Germain); Chapada, near Cuyaba, 4♂ (Smith).

Depositories: BMNH, CMNH.

### *Oospila obeliscata* (Warren)

(Pl. 1: 15, Figs 53, 125, 180)

*Anophylla obeliscata* Warren, 1906: 414. Holotype ♂, in USNM. Type locality: GUYANA. Label data: Guyana: Omai; Type No. 9174 U.S.N.M. [Examined.]

*Oospila obeliscata* (Warren); Prout, 1912: 134; 1933: 58.

♂, ♀ (Pl. 1: 15, Fig. 53). Fore wing length ♂ 18-22 mm, ♀ 23-26 mm; female usually slightly larger than male. Antenna of female bipectinate. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream, yellow and brown. Fore wing: costa pale brown; broad white band along termen from just below apex to tornus, within which run two brown bands parallel to termen; white blotch at wing base with brown irroration linked to tornus by white line along anal edge; discal spot large and distinctive, with brown marking surrounded by white patch. Hind wing: white band along wing margins surrounding central green area; band

along termen with brown lines as in fore wing; white area along anal margin with brown irroration; anterior discal spot large, white, often with brown marking within; posterior discal spot similar, but larger. Hind leg: proximal spurs absent; brush of long hair-like scales present on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 with brushes of long hair-scales present in male; elliptical sclerite on intersegmental membrane of sterna A2 and A3 present in male; sternum A8 of male strongly sclerotized, with bifid posterior extension, each process with serrated apical margin.

GENITALIA ♂ (Fig. 125). As for *callicula*.

GENITALIA ♀ (Fig. 180). As for *callicula*.

DIAGNOSIS. The wing markings of *obeliscata* are somewhat similar to those of *includaria*. However, *obeliscata* is larger than *includaria*, and comparison of the patterns shows that the species are quite distinct (compare Pl. 1: 10 and 15, Figs 37 and 53).

The genitalia of *obeliscata* are indistinguishable from those of *callicula* (Figs 125, 180), but the wing markings are quite different (compare Figs 52 and 53).

The male genitalia of *obeliscata* (and *callicula*) can be recognised by the distinctive form of the ampulla (Fig. 125). The female genitalia can be recognised by the distinctive form of the sterigma and by the appendix at the anterior of the ductus bursae (Fig. 180).

DISTRIBUTION. This species is more widely distributed than *callicula* and has been collected in French Guiana, Guyana, Venezuela, Peru, Bolivia and Brazil.

MATERIAL EXAMINED. **French Guiana:** *Guyane*: St. Jean du Maroni, 3♂, 1♀ (*Le Mout*); 1♀ (*Le Mout*); Cayenne, 1♂; St. Laurent du Maroni, 1♀; Pied Saut, Oyapek River, 1♀, ii.1908 (*Klages*); Roura, Camp Caiman, PK33, 1♀, 2.ii.1983 (*Bleuzen*); Route des Compagnons, km 15, 1♂, viii.1985 (*Bleuzen*); Sinnamary, Piste a St. Elie, km 24, 50 m, 1♂, 18.ii.1991 (*Snyder*); Regina, Piste de Belizon, pk 24, 1♂, 10–11.xi.1991 (*Hermier*); Piste Coralie, pk. 2, 1♀, 12.xi.1991 (*Senecaux, Docquin*); Regine Rte de l'Est, km 85, 175m, 1♀, 12.ii.1991 (*Snyder*). **Guyana:** *Mazaruni-Potaro*: Potaro, 1♂, ii.1908 (*Klages*); Omai, 1♂ [holotype]; Tumatumari, Rio Potaro, 1♂ [no date]; 1♀. **Venezuela:** *Bolivar*: El Boninche Reserve, 200 m, 1♀; El Dorado, Santa Elena, 107 km, Bolivar, 520 m, 1♀. **Peru:** *Cuzco*: Upper Amazon, Santo Anto-

nio de Javary, 1♂, v.1907 (*Klages*). *Puno*: La Union, Rio Huacamayo, Carabaya, 610 m, 1♂, wet season, xi.1904 (*Ockenden*). *Loreto*: Pucallpa, 1♂, 9.xii.1966 (*Schunke*). **Bolivia:** *Santa Cruz*: Mutum, near Puerto Suarez, 1♂; Provincia del Sara, 450 m, 1♂, xi. (*Steinbach*). **Brazil:** Hyntanahan, Rio Purus, 1♂, iii.1922 (*Klages*). *Amapa*: Para, 12♂, 1♀ (*Moss*). *Amazonas*: Manicore, Rio Madeira, 2♂; River Madeira, 1♂ (*Moss*). *Mato Grosso*: Urucum, near Corumba, 1♂; Vila Vera, 55°30' 12°46', 1♀, x.1973 (*Alvarenga*); 1♀. *Rondonia*: Calama, River Madeira, below River Machados, 1♂, x.07 (*Hoffmann*).

Depositories: AMNH, BMNH, CMNH, UCVN, USNM.

### *marginata* and its relatives

*O. marginata* and its relatives includes three species with similar wing markings within the *trilunaria* group. The similarity of these markings suggests that the subgroup is monophyletic. Within this subgroup, males of each species can be identified from the shape of sternum A8, a structure that can be inspected without dissecting the specimen. Females usually require dissection to confirm their identity.

### *Oospila marginata* Warren

(Pl. 1: 16, Figs 54, 75, 126, 181)

*Oospila marginata* Warren, 1897: 427; Prout, 1912: 133. Prout, 1932: 56. Holotype ♀, in BMNH. Type locality: GUYANA. Label data: Type; Brit[ish]. Guiana; Rothschild Bequest B[ritish] M[useum] 1939–I. *Oospila marginata* Type ♀ Warr[en]; Geometridae genitalia slide No. 15030 ♀. [Examined.]

*Oospila rufiplaga* Warren, 1904b: 505; Prout, 1912: 133. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; S[anto] Domingo, Carabaya, 6000 ft, VI. 02 Dry seas[on] (Ockenden); Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15033♂. [Examined.] **Syn.n**

*Oospila marginata sympathes* Prout, 1932: 56. Holotype ♂, in BMNH. Type locality: COLOMBIA. Label data: Type; Ob[er]er Rio Negro, Ost Colombia 800 m Coll[ection] Fassl; [?]; L.B. Prout Coll[ection] B[ritish] M[useum] 1939–643; Seitz VIII. 56; *Oospila marginata sympathes* ♂ type Prout; Geometridae genitalia slide No. 15029 ♂. [Examined.] **Syn.n**

♂, ♀ (Pl. 1: 16, Figs 54, 75). Fore wing length 13–16 mm. Antenna of female bipectinate. Frons



and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches white or red-brown surrounded by dark brown. Fore wing: costa pale brown; subapical blotch small, or absent; blotch at tornus small, or absent (subapical blotch absent in form *sympathes*); discal spot large, brown. Hind wing: blotches at apex and tornus small or absent; anterior discal spot small, white; posterior discal spot large, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 of male strongly sclerotized, bifid.

**GENITALIA** ♂ (Fig. 126). Uncus short, blunt. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla long, narrow, originating near base of valva, apex denticulate; sacculus extended into short, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broadly V-shaped or weakly emarginated. Coremata absent. Aedeagus: vesica lacking cornutus.

**GENITALIA** ♀ (Fig. 181). Ostium: sterigma absent. Bursa copulatrix: ductus bursae with antrum thickened, with convoluted folds, below antrum quite short, not strongly sclerotized or striated; signum small. Anterior apophyses short.

**DIAGNOSIS.** Owing to intraspecific variation in the wing markings of *carnelunata*, *marginata*, *obsolescens* and *tricamerata* the only reliable diagnostic characters are those of the abdomen and genitalia. Males of *marginata* can be distinguished by the shape of sternum A8, which can be examined without dissecting the specimen, and by the genitalia (compare Figs 118 and 126–128). Females of *marginata* can be distinguished from the absence of a sterigma, although this structure is present in *carnelunata*, *tricamerata* and *obsolescens* (compare Figs 174, 181–183) the distinctive thickened and convoluted form of the antrum (Fig. 181) are also characteristic of *marginata*.

**DISTRIBUTION.** Apparently confined to tropical South America.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: St. Laurent du Maroni, 1♀, 1923 (*Aymès*); St. Jean du Maroni, 1♀. **Guyana:** 1♀ [holotype of *marginata*]. **Colombia:** *Meta*: East Colombia: Upper Rio Negro, 800 m, 1♂ [holotype of

*marginata sympathes*] (*Fassl*); 4♂ [paratypes of *marginata sympathes*] (*Fassl*); Buena Vista, 1♀. **Peru:** San Gaban, 1♂; 4♂ (*Mathan*). **Loreto:** Contamana, Rio Ucayali, 1♂, xi–xii.1912. *Madre de Dios*: Tambopata Reserve, 30 km South West Puerto Maldonado, 1♂ (*Covell*). **Puno:** Yahuarmayo, 370 m, 1♂, iv–v.1912; San Gaban, 760 m, 1♂, iii–iv.1913; La Oroya, Rio Inambari, 940 m, 1♂, ix.05 (*Ockenden*); 1♂, wet season, x.1904 (*Ockenden*); Santo Domingo, 1800 m, 1♂ [holotype of *rufiplaga*] dry season, vi.02 (*Ockenden*); Tinguri, 1000 m, 1♂, wet season, i.1905 (*Ockenden*). **Bolivia:** Rio Songo, 750 m, 1♀. **Santa Cruz:** East Bolivia: Buenavista, 750 m, 1♂, viii.06–iv.07 (*Steinbach*); Buenavista, 400 m, 1♂, xi.1914 (*Steinbach*); Provincia del Sara, 450 m, 2♂, xi.1912 (*Steinbach*); 2♂, xii.1912 (*Steinbach*); 1♂, i.1913 (*Steinbach*); 1♂, ii. (*Steinbach*); 1♂, x. (*Steinbach*); 1♂, xi. (*Steinbach*); 1♂, xii. (*Steinbach*); River Yapacani, East Bolivia, 600 m, 2♂, ii.1915 (*Steinbach*). **Brazil:** River Yapacani, 600 m, 2♂. **Mato Grosso:** 4♂, 1886 (*Germain*); 1♂. **Amazonas:** Fonte Boa, Upper Amazon: 1♂; 1♂, viii.1906 (*Klages*); 5♀, vii.1907 (*Klages*); 3♀, viii.1907 (*Klages*); Sao Paulo de Olivença, 2♂, 2♀; Nova Olinda, Rio Purus, 3♂, v.1922 (*Klages*); 2♀, vi.1922 (*Klages*); Hyantanahan, Rio Purus, 1♂, ii.1922 (*Klages*); 1♂, iv.1922 (*Klages*); 1♂ (*Germain*).

**Depositories:** BMNH, CMNH, CVCJ, USNM.

### *Oospila tricamerata* Prout

(Figs 55, 127, 182)

*Oospila tricamerata* Prout, 1916: 171; 1932: 56. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; Fonte Boa, Amazonas, May 1906 (S.M. Klages); *Oospila tricamerata* ♂ type Prout; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15036 ♂. [Examined.]

♂, ♀ (Fig. 55). Fore wing length 12–13 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches white or cream surrounded by red brown. Fore wing: costa pale brown; subapical blotch small, or absent, not connected to blotch at tornus by band along termen; blotch at tornus small, or absent; discal spot small, brown. Hind wing: blotch at apex usually small and narrow, meeting, or continuous with, small subapical blotch, not connected to blotch at tornus by band along termen; blotch at tornus small; blotch at anal margin absent; anterior discal spot

small, white; posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 strongly sclerotized in male, with short, weakly emarginated extension.

**GENITALIA** ♂ (Fig. 127). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla broad, flat, usually with projection close to base (absent from Costa Rican specimens) and denticulate towards apex; sacculus a very broad lobe. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate quite broad. Coremata absent. Aedeagus: vesica with large cornutus.

**GENITALIA** ♀ (Fig. 182). Sterigma approximately rectangular. Bursa copulatrix: ductus bursae wide, moderately long, weakly striated, antrum indistinct; corpus bursae quite large; signum small. Anterior apophyses short.

**DIAGNOSIS.** Owing to intraspecific variation in the wing markings of *carnelunata*, *marginata*, *obsolescens* and *tricamerata* the only reliable diagnostic characters are those of the abdomen and genitalia. The shape of sternum A8 distinguishes males of *tricamerata* from the other species and can be inspected without dissecting the specimen. The shape of the ampulla is characteristic of the male genitalia of *tricamerata* (compare Figs 118 and 126–128). The presence and shape of the sterigma is diagnostic in the female genitalia (compare Figs 174 and 181–183).

**DISTRIBUTION.** Material was examined from Belize, Costa Rica, French Guiana, Surinam, Colombia, Peru and Brazil.

**MATERIAL EXAMINED.** **Belize:** Rio Grande, 1♂ (White). **Toledo:** Punta Gorda, 1♀, vii.1932 (White); 1♂, ix.1932 (White); 1♂, x.1932 (White); 1♂, ii.1932 (White); 1♂, vi.1933 (White); 1♀ (White); 1?, vii.1933 (White); 1♂, iv.1934 (White); 1♂, viii.1934 (White); 1♂, v.1935 (White). **Costa Rica:** Guanacaste: 4 km West Santa Cecilia, 1♂. **French Guiana:** Guyane: Godebert-Maroni, 1♂ [paratype] (*Le Moult*); St. Jean du Maroni, 2♂ (*Le Moult*); 2♂; St. Laurent du Maroni, 1♂, 1♀; Mana River, 3♂, v.1917; Nouveau Chantier, 1♂ (*Le Moult*). **Surinam:** Sipalawini District, Thibiti area, Kabo Creek (partly swampy, primary forest on hilly slopes circa 2 km from river); 1♂. **Suriname:**

Geldersland, Surinam River, 1♂. **Guyana:** Bought at Georgetown, 1♂. **Colombia:** Magdalena Valley, 1♂, v–viii.1920 (Hall). **Meta:** Upper Rio Negro, East Colombia, 800 m, 1♂, 1♀ (Fassl). **Peru:** 1♂ (Mathan). **Amazonas:** Cavallo-Cocho, 1♂, v–vii.1884 (Mathan). **Loreto:** Rio Pacaya, Lower Ucayali, 1♂, vii–ix.1912; Rio Ampiyacu, Putomayo, 1♂. **Brazil:** Rio Topajoz, 1♂. **Amapa:** Para, 1♂ (Moss); 1♂. **Amazonas:** Codajas, Upper Amazon, 1♂ [paratype] iv.1907 (Klages); Fonte Boa, 1♂ [holotype] v.1906 (Klages); 2 ♂ [paratypes] viii.1907 (Klages); Boa Fe, 1♂; Amazonas, 1♂; Above Manaos, 1♀ (Moss). **Mato Grosso:** 1♂ (Germain).

**Depositories:** BMNH, CMNH, INBio, MDHG, USNM.

### *Oospila obsolescens* Prout stat.n.

(Figs 56, 128, 183)

[*Racheolopha trilunaria* Guenée ab. *obsolescens* Warren, 1909: 86. Infra-subspecific name.]

*Oospila rufiplaga obsolescens*; Prout, 1932: 56. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Type; Fonte Boa, Amazonas, August 1906. (S.M. Klages); *Racheolopha trilunaria* Guen[ée] ab. *obsolescens* type ♂ War[en]; Rothschild Bequest B[ritish] M[useum] 1939–1; Geometridae genitalia slide No. 15035 ♂. [Examined.]

♂, ♀ (Fig. 56). Fore wing length 12–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream or red-brown, surrounded by dark brown. Fore wing: costa pale brown; blotch at apex absent; sometimes small subapical blotch present, not connected to blotch at tornus by band along termen; blotch at tornus approximately circular; discal spot large, brown. Hind wing: blotch at apex absent; blotch at tornus small; blotch at anal margin absent; anterior discal spot small, white; posterior discal spot large, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: dorsal surface green; basal crests dark brown, distal crests paler; all crests surrounded by a cream area and enclosed by pink line; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3; sternum A8 of male strongly sclerotized, bifid.

**GENITALIA** ♂ (Fig. 128). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva:



with shallow cleft; ampulla short, broad, robust, conspicuously denticulate at apex; sacculus with very short extension. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broad. Coremata absent. Aedeagus: vesica without cornutus.

GENITALIA ♀ (Fig. 183). Ostium: sterigma approximately elliptical. Bursa copulatrix: ductus bursae quite long, weakly sclerotized, not striated, antrum absent. Bursa copulatrix large, signum large. Anterior apophyses short.

DIAGNOSIS. Owing to intraspecific variation in the wing markings of *carnelunata*, *marginata*, *obsolescens* and *tricamerata* the only reliable diagnostic characters are those of the abdomen and genitalia. Males can be distinguished from those of *marginata* and *tricamerata* by the shape of sternum A8 (compare Figs 126–128) which can be examined without dissecting the specimens and from those of *carnelunata*, *marginata*, *obsolescens* and *tricamerata* by the genitalia, especially the shape of the ampulla (compare Figs 118 and 126–128). The presence of an elliptical sterigma distinguishes the female genitalia of *obsolescens* from the other species (compare Figs 174 and 181–183). Specimens of *obsolescens* are usually smaller than those of *marginata* and *tricamerata*, but the ranges of size overlap so whilst a useful guide, this character is not diagnostic.

DISTRIBUTION. Material was examined from Surinam, Peru, Bolivia, Brazil.

REMARK. Originally, *obsolescens* was originally used by Warren (1909), as an infra-subspecific name. Prout (1932) described *obsolescens* as a subspecies of *rufiplaga*.

MATERIAL EXAMINED. **Surinam:** Sipalawini District, Thibiti area, Kabo Creek (partly swampy, primary forest on hilly slopes circa 2 km from river) 2♂. **Peru:** Amazonas: Cavallo-Cocho, 1♂, v–vii.1884 (*Mathan*). **Bolivia:** Santa Cruz: Provincia del Sara, 450 m, 1♂; East Bolivia, River Yapacani, 600 m, 1♂, ii.1914 (*Steinbach*); 2♂, ii.1915 (*Steinbach*). **Brazil:** Amazonas: Fonte Boa, 1♂ [holotype] viii.1906 (*Klages*); 1♂, vii.1906 (*Klages*); 1♂, 1♀ viii.1906 (*Klages*); 1♀ (*Klages*); 1♀, ix.06 (*Klages*); 1♀, viii.1907 (*Klages*). Amazonas: Sao Paulo de Olivença, 1♂, i.1933 (*Waehner*).

*Depositories:* BMNH, CMNH, MDHG.

### *atopochlora* and its relatives

(*atopochlora*, *hyalina*, *atroviridis*, *congener*)

*O. atopochlora* and its relatives includes a sub-

group of four species within the *trilunaria* group. The wing markings of the species are very similar (see Figs 57–60), but the monophyly of the subgroup has not been established.

### *Oospila atopochlora* Prout

(Figs 57, 129, 184)

*Oospila atopochlora* Prout, 1933: 57. Holotype ♂, in BMNH. Type locality: COLOMBIA. Label data: Type; Muzo, Colombia 400–800 m Coll[ection] Fassl; Seitz VIII 57; *Oospila atopochlora* Prout ♂ type; L.B. Prout Coll[ection] B[ritish] M[useum] 1939–643; Geometridae genitalia slide No. 15047 ♂ [Examined.]

♂, ♀ (Fig. 57). Fore wing length 16–21 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark brown or black. Wings: ground colour dark green; blotches dark brown or black. Fore wing: costa pale brown; blotch at apex large, but not extending to costa, and not connected to blotch at tornus via termen; blotch at tornus large; discal spot large, dark brown or black. Hind wing: blotch at apex large, enclosing smaller subapical green area on termen, not connected to blotch at tornus via termen; blotch at tornus large; blotch at anal margin absent; anterior discal spot small, dark brown or black; posterior discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface dark brown or black at anterior, green posteriorly; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized, deeply emarginated.

GENITALIA ♂ (Fig. 129). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: ampulla relatively short, digitate, with denticulate apex; sacculus extended into short point. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: with two large carinae; vesica with a small cornutus.

GENITALIA ♀ (Fig. 184). Sterigma absent. Bursa copulatrix: ductus bursae not differentiated from corpus bursae, but with large antrum; not strongly sclerotized or striated; corpus bursae large, more strongly sclerotized than in most *Oospila*, with wavy folds; signum large. Anterior apophyses short.

**DIAGNOSIS.** *Oospila atopochlora* is larger than *congener*. Also, it has a small subapical green area on the termen of the hind wing, an area that is dark brown or black in *congener* (compare Figs 57 and 60). The male genitalia of the two species are very similar, but *atopochlora* can be identified by the presence of two large carinae towards the base of the aedeagus (compare Figs 129 and 132). The female genitalia of *atopochlora* are distinguished from those of *congener* by the absence of a sterigma (compare Figs 184 and 186).

The presence of the large blotch at the apex of the fore wing in *atopochlora* distinguishes the species from *hyalina* (compare Figs 57 and 58). Furthermore, *hyalina* has two separate dark brown or black markings at the apex of the hind wing, joined by a dark brown or black band along the termen whereas *atopochlora* has a single blotch.

**DISTRIBUTION.** Material was examined from Nicaragua, Costa Rica, Panama, Guyana, Venezuela, Colombia, Ecuador and Brazil. There is also a record of one male from San Gaban in Peru (Prout, 1932), although the location and identity of the specimen has not been confirmed.

**MATERIAL EXAMINED.** **Nicaragua:** *Zelaya:* Eden, 14°0'N 84°26'W, 1♂, 24.iii.1922 (*Wharton, Huber*); 1♂, 24.iv.1922 (*Wharton, Huber*); 1♂, 17.v.1922 (*Wharton, Huber*). **Costa Rica:** *Heredia:* La Selva Biological Station, Puerto Viejo de Sarapiquí, 40 m, 1♂, x.1986 (*Chavarria*); 1♂, iv.1987 (*Chavarria*). *Limon:* Cerro Tortuguero, North edge Tortuguero National Park, 0–100 m, 1♀, 30.v.1984 (*Janzen, Hallwachs*); 9.4 km West of Bribi, Suretka, 200 m, 1♂, 9–11.vi.1983 (*Janzen, Hallwachs*); 1♂, iv.1989 (*Aguillar, Solano*). *Puntarenas:* Estacion Quebrada Bonita, 50 m R.B. Carara, 1♂, ix.1989 (*Zuniga*); 1♂, x.1989 (*Zuniga*); Fila Esquinas, 35 km South of Palmar Norte, 8°45' x 83°20', 4♂, 1♀, 7–8.i.1983 (*Janzen, Hallwachs*); Manuel Antonio National Park Quepos, 30 m, 1♂, v.1987 (*Chacon*); 1♂, vi.1987 (*Chacon*); Las Cruces Biological Station, San Vito, 1200 m, 1♀, 16–20.xi.1987 (*Chacon*). *Osa Peninsula:* Sirena Corcovado National Park, 1♂, 10–12.viii.1980 (*Janzen, Hallwachs*); 1♂, 1♀, 5–11.i.1981 (*Janzen, Hallwachs*); 1♂, 1.v.1984 (*Janzen, Hallwachs*); Sirena Corcovado: 1♀, iv.1989 (*Blanco, Fonseca*); 1♀, ii.1990 (*Fonseca*); Finca Cafrosa, Estacion Las Mellitzas, Parque Nacional Amistad, 1300 m, 1♂, 20.viii–4.ix.1989 (*Ramirez, Mora*). **Panama:** *Canal Zone:* Barro Colorado Island, 1♀.

**Guyana:** *Mazaruni-Potaro:* Omai, 2♂. **Venezuela:** *Bolivar:* Forestal Imataca, El Boninche Reserve, Bolivar, 200 m, 1♂, 6–13.xii.74. **Colombia:** *Boyaca:* Muzo, 400–800 m, 1♂ [holotype] (*Fassl*); 3♂ [paratypes]. *Meta:* Buena Vista, 2♂, 1♀. **Ecuador:** Tung Banos (39 km East) 1♀. **Brazil:** *Amazonas:* Sao Paulo de Olivença, 2♂; Hyntanahan, Rio Purus, 3♂, ii.1922 (*Klages*); 2♂, iii.1922 (*Klages*).

*Depositories:* BMNH, CMNH, INBio, UCVN, USNM.

### *Oospila hyalina* Warren

(Figs 58, 130, 185)

*Oospila hyalina* Warren, 1897: 427; Prout, 1912: 133; 1933: 59. Holotype ♀, in BMNH. Type locality: COLOMBIA. Label data: Type; Bogota; Rothschild Bequest B[ritish] M[useum] 1939–I; *Oospila hyalina* Warr[en] type ♀; Geometridae genitalia slide No. 15042 ♀. [Examined.]

[*Halioscia atroviridis* Warren, 1907: 202. In part. Misidentification of ♀.]

[*Halioscia ruptimacula* Warren, 1909: 77. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Union, Huacamayo, Carabaya, 2000 ft, wet season, Dec[ember] 1904. (G. Ockenden); *Halioscia ruptimacula* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; find in Seitz vol 8; *Oospila fractimacula* Prout nom. nov; *ruptimacula* Warr[en] nom. praeocc; Geometridae genitalia slide No. 15044 ♂. [Examined. A junior secondary homonym of *Oospila ruptimacula* Warren, 1901: 448.]

*Oospila fractimacula* Prout, 1912: 134. Prout, 1932: 56. [New name for *Halioscia ruptimacula* Warren, 1909 by Prout, 1912: 134.] **Syn.n.**

♂, ♀ (Fig. 58). Fore wing length ♂ 12–14 mm, ♀ 20 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches dark brown or black. Fore wing: costa pale brown; blotch at apex small, approximately rectangular, not extending to costa, not connected to blotch at tornus via termen; blotch at tornus larger; discal spot large, round, dark brown or black. Hind wing: blotch at apex divided into two small markings with central green patch between, not connected to blotch at tornus via termen; blotch at tornus small; blotch at anal margin absent; anterior discal spot small, white; posterior discal spot large, dark brown or black. Hind leg: proximal spurs absent; brush of long hair-like scales



absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 strongly sclerotized in male, with bifurcate posterior extension.

**GENITALIA** ♂ (Fig. 130). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: excavated; ampulla short, pointed; short sclerotized process also present where valva widens; sacculus lobed. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

**GENITALIA** ♀ (Fig. 185). Ostium: sterigma very large, approximately elliptical, with posterior edge emarginated. Bursa copulatrix: ductus bursae long, antrum absent; strongly sclerotized, and striated; corpus bursae moderately small, sclerotized, with some striations; signum large. Anterior apophyses short.

**DIAGNOSIS.** *Oospila hyalina* can be distinguished from *atopochlora* and *congener* by the small, narrow subapical blotch of the fore wing, which never extends to the costa in *hyalina* (compare Figs 57, 58 and 60). *Oospila hyalina* can also be distinguished by the form of the blotch at the apex of the hind wing, which is split into two small, completely separate, dark brown or black patches. The male genitalia of *hyalina* can be recognised by the presence of a second short, pointed process (in addition to the ampulla) on the valvae (Fig. 130).

**DISTRIBUTION.** Known only from Colombia, Ecuador and Peru.

**REMARK.** Warren (1907: 202) misidentified one female specimen of *hyalina* Warren as *atroviridis* Warren.

**MATERIAL EXAMINED.** **Colombia:** *Cundinamarca:* Bogota, 1♀ [holotype of *hyalina*]; 1♀. *Antioquia:* El Cerro, Frontino, Dept di Antioquia, 1800 m, 1♂, 17.vi.1938. **Ecuador:** Carchi, Chical, 0°56'N 78°11'W, 1250 m, 1♂, 31.vii.78 (*Rawlins*); 1♀, 18.vii.1983 (*Rawlins, Davidson*). *Morona-Santiago:* 40 km North North East Macas, 2°05'S 78°01'W, 1020 m, 1♂, 13.vi.1983 (*Rawlins, Thompson*). **Peru:** *Puno:* La Union, Rio Huacamayo, 610 m, 1♂ [holotype of *Halioscia ruptimacula*] wet season, xii.04 (*Ockenden*); South East Peru: La Oroya, Rio Inambari, 940 m, 1♀, wet season, iii.05 (*Ockenden*).

**Depositories:** BMNH, CMNH, USNM.

### *Oospila atroviridis* Warren stat. rev.

(Pl. 1; 17, Figs 59, 131)

*Oospila atroviridis* Warren, 1904a: 24; Prout, 1912: 133. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; S[anto] Domingo, Carabaya, 6000 ft, XII.01. wet seas[on] (*Ockenden*); Rothschild Bequest B[ritish] M[useum] 1939-I; *Oospila atroviridis* type ♂ Warr[en]; Geometridae genitalia slide No. 15043♂. [Examined.]

*Halioscia atroviridis* Warren, 1907: 202. [In part. 1♀ of *hyalina* misidentified as *atroviridis*.]

*Oospila hyalina atroviridis* Warren; Prout, 1933: 59.

*Oospila dolens* Druce, 1911: 293; Prout, 1933: 59. Holotype ♂, in BMNH. Type locality: COLOMBIA. Label data: Type; La Maria Dagua Valley W[est] Colombia, 4700 ft May '08; Joicey Bequest. Brit[ish] Mus[eum] 1934-120; *Oospila dolens* type Druce; Det[ermined] by L.B. Prout; Geometridae genitalia slide No. 15726 ♂. [Examined.] **Syn.n.**

♂ (Pl. 1: 17, Fig. 59). Fore wing length 13–14 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches large, prominent, dark brown or black. Fore wing: costa pale brown; blotches merged to give broad band along termen, sometimes broken by small green patch or patches usually towards apex or at termen; discal spot large, brown. Hind wing: dark brown blotches at apex and tornus, usually separate, but occasionally merging along termen; anterior discal spot small, white; posterior discal spot large, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface dark brown or black; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 of male strongly sclerotized, bifid.

**GENITALIA** ♂ (Fig. 131). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: ampulla short, curved, with short basal projection; sacculus developed into short, pointed process with lobe basad of this. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Aedeagus: vesica with cornutus.

**GENITALIA** ♀. Unknown.

**DIAGNOSIS.** *Oospila atroviridis* can be distin-

guished from *atopochlora*, *congener* and *hyalina* by its smaller size and by the more extensive dark brown markings on the wings (compare Pl. 1: 17, Figs 57–60). In *atroviridis* the dark brown markings on the fore wing are continuous whereas in the other species the blotches are separate and have green patches between them.

Most specimens can be distinguished from *zamaradaria* because whereas *atroviridis* has two separate dark brown blotches on the hind wings, in *zamaradaria* there is a continuous dark brown line along the termen of the hind wing (compare Pl. 1: 17, Figs 29 and 59). The presence of an anterior white discal spot and a posterior dark brown or black discal spot also distinguishes *atroviridis* from *zamaradaria*, which has a single, or no discal spot.

The darker, blacker colour of the markings and the presence of large, prominent, discal spots distinguish *atroviridis* from *camilla* (compare Pl. 1: 5, 17, Figs 21 and 59).

**DISTRIBUTION.** Known only from Colombia and Peru.

**MATERIAL EXAMINED.** **Colombia:** *Antioquia:* El Cerro, Frontino, 1♂. *Valle:* La Maria, Dagua Valley, 1400 m, 1♂ [holotype of *dolens*] v.08. **Peru:** *Puno:* Santo Domingo Carabaya, 1800 m, wet season, 1♂ [holotype of *atroviridis*] xii.01 (*Ockenden*); 1♂, wet season, i.02 (*Ockenden*); 2♂, wet season, iv.02 (*Ockenden*); 1♂, dry season, vii.02 (*Ockenden*); 1♂, dry season, x.02 (*Ockenden*); 1♂, wet season, xi.02 (*Ockenden*); 1♂, wet season, xii.02 (*Ockenden*); *La Oroya,* Rio Inambari, 940 m, 1♂, dry season, ix.04 (*Ockenden*); 1♂, wet season, x.04 (*Ockenden*); 1♂, wet season, iii.05 (*Ockenden*); *Quinton,* 1500 m, 1♂, i.1905 (*Ockenden*).

*Depository:* BMNH.

### *Oospila congener* Warren

(Figs 60, 132, 186)

*Oospila congener* Warren, 1900: 136; Prout, 1912: 133; 1933: 57. Holotype ♂, in BMNH. Type locality: GUYANA. Label data: Type; Rio Demerara. VII.97; Rothschild Bequest B[ritish] M[useum] 1939–I; *Oospila congener* type ♂ Warr[en]; Geometridae genitalia slide No. 15045 ♂. [Examined.]

*Halioscia congener* Warren, 1907: 203.

*Halioscia procellosa* Warren, 1907: 202. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Oroya, R[io] Inambari, Peru, Sept 1904 3100 ft, dry seas[on] (G. Ockenden); *Halioscia procellosa* type ♂ War-

r[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15046 ♂. [Examined.] **Syn.n.**

*Oospila procellosa* (Warren); Prout, 1912: 134.

*Oospila congener procellosa* (Warren); Prout, 1933: 57.

♂, ♀ (Fig. 60). Fore wing length 12–19 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches dark brown or black. Fore wing: with costa pale brown; blotch at apex large, approximately circular, not extending to costa, not connected to blotch at tornus via termen; blotch at tornus large; discal spot large, diffuse, dark brown or black. Hind wing: blotch at apex large, not broken by internal green markings (as it is in *atroviridis* and *atopochlora*); anterior discal spot large, diffuse, dark brown or black; posterior discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface dark brown, or black; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 strongly sclerotized in male, emarginated.

**GENITALIA** ♂ (Fig. 132). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: ampulla short, digitate; sacculus extended into very short, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate squarish. Coremata absent. Aedeagus long, narrow, and curved; vesica with small cornutus.

**GENITALIA** ♀ (Fig. 186). Ostium: sterigma with two apical pockets of varying size; often with smaller central apical projection (as in Fig. 186). Bursa copulatrix: ductus bursae not strongly sclerotized or striated, but with folds, antrum indistinct; corpus bursae slightly wider than ductus, signum large. Anterior apophyses short.

**DIAGNOSIS.** *Oospila congener* is smaller than *hyalina* and the blotch at the apex of the fore wings is large and approximately circular. The blotch at the apex of the hind wing is not divided into two smaller markings in *congener* as it is in *atopochlora* and *hyalina* (compare Figs 57, 58 and 60). The separation of blotches at the apex from those at the tornus of all wings distinguishes *congener* from *atroviridis*, in which these blotches are merged (compare Pl. 1: 17, Figs 59 and 60). Females of *congener* can be recognised



by the distinctive form of the sterigma (Fig. 186).

**DISTRIBUTION.** Material was examined from French Guiana, Guyana, Colombia, Peru, Bolivia and Brazil.

**MATERIAL EXAMINED.** **French Guiana:** *Guyane*: Nouveau Chantier, 1♀, ii. (Le Moul't); St. Laurent du Maroni, 1♂; Mana River, 1♂, v.1917. **Guyana:** *East Demerara-West Coast Berbice*: Demerara River, 1♂ [holotype of *congener*] vii.97. *Mazaruni-Potaro*: Potaro, 1♀, ii.1908 (*Klages*). **Colombia:** Merida, 500 m, 1♂. *Meta*: East Colombia, Upper Rio Negro, 800 m, 4♂ (*Fassl*). **Peru:** *Puno*: La Oroya, Rio Inambari, 940 m, 1♂ [holotype of *procellosa*] dry season, ix.1904 (*Ockenden*); 3♂, dry season, ix.1904 (*Ockenden*); 7♂, wet season, iii.1905 (*Ockenden*); 2♂, dry season, v.1905 (*Ockenden*); 1♂, ix.05 (*Ockenden*); 2♂, xi–xii.1905 (*Ockenden*); 2♂, xii.05 (*Ockenden*); La Oroya, South East Peru, 910 m, 1♂, 1♀ (*Ockenden*); Carabaya, Tinguri, 1000 m, 1♂, dry season, viii.1904 (*Ockenden*); 1♀ [paratype of *procellosa*] viii.1904 (*Ockenden*); San Gaban, 760 m, 1♂, iii–iv.1912. **Bolivia:** Rio Songo, 1♂. **Brazil:** *Amazonas*: Fonte Boa, 2♂, v.1906 (*Klages*); 4♂, vi.1906 (*Klages*); 2♂, viii.1906 (*Klages*); 1♂, vii.1907 (*Klages*); 1♀ (*Klages*); Hyntanahan, Rio Purus, 1♂, i.1922 (*Klages*); 1♂, ii.1922 (*Klages*); 1♂, iii.1922 (*Klages*); 1♂, vi.1922 (*Klages*). *Amapa*: Para, 13♂, 3♀ (*Moss*). *Para*: Unt. Amaz. Taperinha, below Santarem, 1♂, 21–31.vii.27 (*Zerny*); Monte Cristo, Tapajos, 1♂.

*Depositories:* BMNH, CMNH, USNM.

### *Oospila immaculata* sp.n.

(Figs 61, 133, 187)

Holotype ♂, in MNRJ. Type Locality: BRAZIL. Label data: Col Becker 58355; Planaltina D[istrito] F[ederal], BRASIL – 1000 m, 15°35'S 47°42'W, 3.viii.1986, V.O. Becker col; Geometridae genitalia slide No. 14684 ♂. [Examined.]

♂, ♀ (Fig. 61). Fore wing 13–14 mm. Antenna of female bipectinate. Frons and vertex green. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: pale green; unmarked. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; with cream area around crests enclosed by pink line, remainder of dorsal surface green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite on intersegmental membrane of sterna A2 and

A3 of male absent; sternum A8 of male strongly sclerotized, bifid.

**GENITALIA** ♂ (Fig. 133). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla absent; sacculus extended into robust, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broad, robust, emarginated. Coremata absent. Aedeagus: vesica with large cornutus and some denticles.

**GENITALIA** ♀ (Fig. 187). Ostium: sterigma absent. Bursa copulatrix with antrum long, ductus bursae below antrum very long, with U-bend, strongly sclerotized, striated; corpus bursae large; signum absent. Anterior apophyses short.

**DIAGNOSIS.** *Oospila immaculata* can be distinguished from *holochroa* and *stagonata* by the absence of a discal spot on the fore wings (compare Figs 34, 61 and 73). The absence of a small marking at the tornus of the fore wing and hind wing distinguishes *immaculata* from *decoloraria* (compare Figs 61 and 64). The female genitalia of *immaculata* can be recognised by the U-bend of the ductus bursae (Fig. 187).

**DISTRIBUTION.** The two specimens examined were collected in Brazil.

**MATERIAL EXAMINED.** **Brazil:** RJ Cach. do Macacu, 600 m, 1♀ [paratype] 13.x.1985 (*Becker*). *Distrito Federal*: Planaltina, 15°35'S 47°42'W, 1000 m, 1♂ [holotype] 3.viii.1986 (*Becker*).

*Depositories:* MNRJ, VOB.

### *Oospila rubescens* (Warren)

(Figs 62, 134, 188)

*Racheolopha rubescens* Warren, 1906: 423. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean; Schaus Coll[ection]; Type No. 9192 U.S.N.M.; Genitalia slide by MAC 57763 USNM. [Examined.]

*Oospila rubescens* (Warren); Prout, 1933: 58.

♂, ♀ (Fig. 62). Fore wing length 8–10 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; blotch at apex large, extending to costa, connected to blotch at tornus via termen; blotch at tornus large; discal spot small, brown. Hind wing: blotches at apex and tornus large, connected via termen; discal spot small, white.

Hind leg: proximal spurs absent; brush of long hair-like scales present on male tibia. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream or brown; sternum A2 of male with brushes of long hair-like scales present; elliptical sclerite present on intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized, bifid.

GENITALIA ♂ (Fig. 134). Uncus very short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla long, arising close to base of valva; sacculus extended into short, robust, serrated process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica without cornutus.

GENITALIA ♀ (Fig. 188). Ostium: sterigma a bar with each end expanded into a pocket. Bursa copulatrix: ductus bursae broad, quite long, with short, strongly sclerotized antrum, weakly striated below antrum; corpus bursae with small signum. Anterior apophyses short.

DIAGNOSIS. In *rubescens* the blotch at the apex of the fore wing extends to the costa whereas it does not in *circumsignata* (compare Figs 62 and 63). Males can also be distinguished by the presence of a brush of long hair-like scales on the hind tibia of *rubescens*. The female genitalia of *rubescens* can be recognised by the distinctive shape of the sterigma and the pocket on each side (Fig. 188).

DISTRIBUTION. Known only from French Guiana and Surinam.

MATERIAL EXAMINED. **French Guiana:** *Guyane*: St. Jean du Maroni, 1♂ [holotype]; 8♂, 4♀ (*Le Moult*); 1♂ (*Le Moult*); 1♂ (*Bar*); 8♂, 4♀; Roches de Kourou, 1♂. **Surinam:** *Marowijne*: Areowarwa Creek, Marowym Valley, 1♀, iv.05 (*Klages*).

*Depositories:* BMNH, USNM.

### *Oospila circumsignata* Prout

(Figs 63, 135)

*Oospila circumsignata* Prout, 1916: 171; 1933: 58. Holotype ♂, in BMNH. Type locality: BRAZIL. Label data: Fonte Boa, Upp[er] Amazon, August 1907. (S.M. Klages); Rothschild Bequest B[ritish] M[useum] 1939-1; *Oospila circumsignata* ♂ type Prout; Geometridae genitalia slide No. 15720 ♂. [Examined.]

♂ (Fig. 63). Fore wing length 10–11 mm. Frons

and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings pale brown, with dark brown perimeters and irrorations. Fore wing: costa pale brown; blotch at apex not extending along costa (unlike situation in *rubescens*, Fig. 62), connected to blotch at tornus via termen; blotch at tornus large, approximately rectangular, extending 2/3 length of anal margin; discal spot small, brown. Hind wing: blotch at apex extending 1/2 length of termen, connected to blotch at tornus via termen; blotch at anal margin absent; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; crests surrounded by pink area, remainder of dorsal surface green; sternum A2 in male with hair brushes present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 of male present; sternum A8 in male strongly sclerotized, bifid.

GENITALIA ♂ (Fig. 135). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, curved, with denticulate apex; sacculus extended into strongly sclerotized, pointed process. Anellar complex: completely surrounding aedeagus, with two large, approximately rectangular ventral plates. Coremata absent. Vinculum: ventral plate V-shaped. Aedeagus: vesica with small cornutus.

GENITALIA ♀. Unknown.

DIAGNOSIS. *Oospila circumsignata* is very similar in external appearance to *rubescens* (compare Figs 62 and 63), but the blotch at the apex of the fore wing in *circumsignata* does not extend along the costal edge as it does in *rubescens*. *Oospila circumsignata* is also slightly larger than *rubescens*. Males can be distinguished by the lack of a brush of long hair-like scales on the hind tibia of *circumsignata*.

*Oospila circumsignata* can be distinguished from *asmura* by the lack of a short extension of the hind wing at the apex of vein M<sub>3</sub> (compare Figs 17 and 63). These two species can also be distinguished by the form of the blotch at the tornus of the hind wing which is extended along the anal margin in *asmura*.

The male genitalia of *circumsignata* can be recognised by the curved form of the ampulla and the large ventral plates of the anellar complex (Fig. 135).

DISTRIBUTION. Only 6 specimens of this species were examined, all from the Amazonas region of Brazil.



MATERIAL EXAMINED. **Brazil:** Amazonas: Sao Paulo de Olivença, 2♂. Fonte Boa, 1♂, vii.1907 (*Klages*); 1♂ [holotype] viii.1907 (*Klages*); Nova Olinda, Rio Purus, 2♂, v.1922 (*Klages*).

*Depositories:* BMNH, CMNH, USNM.

### *Oospila decoloraria* (Walker)

(Figs 64, 136, 189)

*Iodis decoloraria* Walker, 1861: 541. Holotype ♀ [see remarks], in BMNH. Type locality: JAMAICA. Label data: Jamaica; Type, 45 110; 7. IODIS DECOLORARIA; Geometridae genitalia slide No. 15703 ♀. [Examined.]

*Oospila decoloraria* (Walker); Prout, 1912: 133; 1932: 56.

♂, ♀ (Fig. 64). Fore wing length 8–11 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: dark green, blotches absent. Fore wing: costa pale brown; unmarked except for minute brown spot at tornus. Hind wing: small brown spot at tornus; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; crests surrounded by narrow white line, remainder of dorsal surface green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite on intersegmental membrane of sterna A2 and A3 in male absent; sternum A8 of male strongly sclerotized, bifid.

GENITALIA ♂ (Fig. 136). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, apex weakly curved and denticulate; sacculus extended into long spine-like process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate rounded, with short, anterior extension. Coremata absent. Aedeagus: strongly curved in unique specimen; vesica with short cornutus.

GENITALIA ♀ (Fig. 189). Ostium: sterigma a semicircular plate, with deep emargination of posterior edge. Bursa copulatrix: ductus bursae narrow posteriorly, widening anteriorly, strongly sclerotized and striated, antrum indistinct; corpus bursae large, approximately spherical; signum small. Anterior apophyses relatively long.

DIAGNOSIS. *Oospila decoloraria* is recognisable from most other species by having almost unmarked wings. Males can be distinguished from those of *confundaria* by the absence of a

brush of long hair-like scales on the hind leg of *decoloraria*. In the females of *decoloraria* the antenna is bipectinate, whereas in *confundaria* it is simple.

*Oospila decoloraria* can be distinguished from *immaculata* by the presence of minute markings at the tornus of both fore and hind wings (compare Figs 61 and 64).

The male genitalia of *decoloraria* can be recognised by the shape of the valvae, ampullae and anellar complex (Fig. 136). In the female, the form of the sterigma is diagnostic (Fig. 189).

DISTRIBUTION. The nine specimens examined were collected in Cuba and Jamaica.

REMARKS. The sex of the holotype was incorrectly given as male in the original description (Walker, 1861: 541).

The strong curvature of the aedeagus in this species is probably valid, and not an artifact of preparation, given the curvature (less pronounced) occurring in other species.

MATERIAL EXAMINED. **Cuba:** 3♀. Baracoa, 1♂. Cayamas, 2♀. Santiago, 1♀. **Jamaica:** 1♀ [holotype]. Newcastle, 1♀, viii.93.

*Depositories:* BMNH, USNM.

### *Oospila jaspidata* (Warren)

(Figs 65, 190)

*Racheospila* (?) *jaspidata* Warren, 1897: 430.

Holotype ♀, in BMNH. Type locality: GUYANA. Label data: Type; Rio Demerara British Guiana; *Racheospila jaspidata* type ♀? Warr[en]; *Racheolopha*; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15049 ♀. [Examined.]

*Racheolopha jaspidata* (Warren), 1900: 137.

*Drucia jaspidata* (Warren), 1906: 416.

*Oospila jaspidata* (Warren); Prout, 1912: 133; 1933: 59.

♀ (Fig. 65). Fore wing length 10–12 mm. Antenna unknown. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings reddish brown. Fore wing: costa pale brown; blotch at apex large, extending to costa, extended posteriorly along termen to meet blotch at tornus; blotch at tornus smaller; discal spot small, brown. Hind wing: blotch at apex large, connected to blotch at tornus via termen; blotch at tornus small, not connected to blotch at anal margin; blotch at anal margin reduced to a line; discal spot small, brown. Hind leg with proximal spurs absent. Abdomen: basal crests

dark brown, distal crests paler; remainder of dorsal surface reddish; sterna simple.

GENITALIA ♂. Unknown.

GENITALIA ♀ (Fig. 190). Ostium: sterigma absent. Bursa copulatrix: ductus bursae very short, weakly sclerotized, not striated, antrum absent; bursa copulatrix very large; signum small. Anterior apophyses relatively long.

DIAGNOSIS. *Oospila jaspidata* is similar in appearance to *excrescens*, but lacks a brick-red marking at the base of the fore wing (compare Pl. 1: 2, Figs 10 and 65).

*Oospila jaspidata* may be distinguished from *continuata* by the redder colour of the wing markings and by the shape of the blotch at the apex of the fore wing, which is rounded in *jaspidata* and lacks the distinct apical emargination of *continuata* (compare Figs 9 and 65).

DISTRIBUTION. Only two females were examined, one from French Guiana, the other from Guyana.

MATERIAL EXAMINED. **French Guiana:** *Guyane*: St. Jean du Maroni, 1♀. **Guyana:** *East Demerara-West Coast Berbice*: Demerara River, 1♀ [holotype].

*Depositories*: BMNH, USNM.

### *Oospila longiplaga* Warren

(Figs 66, 137, 191)

*Oospila longiplaga* Warren, 1909: 83; Prout, 1912: 134; 1933: 57. LECTOTYPE ♀, here designated, in BMNH. Type locality: BRAZIL. Label data: Type; Fonte Boa, Amazonas, September 06. (S.M. Klages); *Oospila longiplaga* type ♀ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15717 ♀. [Examined.]

♂, ♀ (Fig. 66). Fore wing length 12–13 mm. Female antenna bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream or pale brown irrorated with dark brown, perimeters dark brown. Fore wing: costa pale brown; blotch at apex large, approximately circular, extending to costa, not connected via termen to blotch at tornus; blotch at tornus long, extending to cover discal spot, extending 2/3 of anal margin, wider towards centre of wing, narrowing slightly towards termen; discal spot absent. Hind wing: blotch at apex large, relatively narrow, approximately rectangular but narrower where extended along

costa, extending 1/2 length of termen, not connected to blotch at tornus; blotch at tornus large, approximately rectangular, extending 2/3 length of anal margin; blotch at anal margin absent; discal spot small, white or absent. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite on intersegmental membrane of sterna A2 and A3 of male present; sternum A8 of male strongly sclerotized, bifid.

GENITALIA ♂ (Fig. 137). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: costal edge with small, subapical point; ampulla short, with pointed apex; sacculus weakly developed. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broadly V-shaped. Coremata absent. Aedeagus: vesica with short cornutus.

GENITALIA ♀ (Fig. 191). Ostium: sterigma absent. Bursa copulatrix: ductus bursae long, strongly sclerotized and striated, antrum indistinct; corpus bursae large, approximately spherical; signum very small. Anterior apophyses short.

DIAGNOSIS. The size and shape of the blotches distinguish *longiplaga* from most other species. *Oospila longiplaga* can be distinguished from *lunicincta* and *ruptimacula* by the large blotch at the tornus of the fore wing, which extends to the discal cell in *longiplaga* (compare Pl. 1: 18, Figs 66, 67 and 69).

*Oospila longiplaga* may be distinguished from *albicoma albicoma*, *albicoma nasuta*, *concinna* and *depressa* by the absence of a blotch on the anal margin of the hind wing in *longiplaga* and by the long, rectangular blotch at the tornus of the hind wing (compare Pl. 1: 11, 20, Figs 39–41, 66 and 72).

The male genitalia of *longiplaga* can be recognised by the presence of a small subapical extension of the costal edge of the valvae (Fig. 137).

DISTRIBUTION. The three specimens examined were collected from the Amazonas region of Brazil.

MATERIAL EXAMINED. **Brazil:** *Amazonas*: Fonte Boa, 1♀ [lectotype] ix.06 (Klages); 1♀ [paralectotype] ix.06 (Klages); Alto Paraíso, 100 m, 1♂, 4.x.1985 (Becker).

*Depositories*: BMNH, VOBV.



*Oospila lunicincta* (Warren)

(Figs 67, 138, 192)

*Racheolopha lunicincta* Warren, 1909: 85. Holotype ♂, in BMNH. Type locality: PARAGUAY. Label data: Type; Sapucay, Paraguay, 16.ix.03 (W. Foster); fi[g] in Seitz 8; *Racheolopha lunicincta* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-1; Geometridae genitalia slide No. 15724 ♂. [Examined.]

*Auophyllodes lunicincta* (Warren); Prout, 1912: 131.

*Oospila lunicincta* (Warren); Prout, 1933: 58.

♂, ♀ (Fig. 67). Fore wing length 12–13 mm. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings cream, irrorated with brown, with dark perimeters. Fore wing: costa pale brown; subapical blotch small, not extending to costa, not connected via termen to blotch at tornus; blotch at tornus small; discal spot absent. Hind wing: blotch at apex large, not connected via termen to blotch at tornus; blotch at tornus small, not connected to blotch at anal margin; blotch at anal margin reduced to an inconspicuous crescent; discal spot small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream with pink and brown flecks; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized, deeply excavated.

GENITALIA ♂ (Fig. 138). Uncus short, pointed. Socii large. Gnathos: not fused, not reduced. Valva: ampulla broad, robust, margin denticulate; sacculus not developed. Anellar complex surrounding aedeagus. Vinculum: ventral plate broad, emarginated, with posteriorly directed extension. Coremata absent. Aedeagus: vesica with small cornutus.

GENITALIA ♀ (Fig. 192). Ostium: with pocket on each side; sterigma absent. Bursa copulatrix: ductus bursae strongly sclerotized, not striated, antrum absent; corpus bursae small; signum quite large. Anterior apophyses short.

DIAGNOSIS. In general, *lunicincta* can be distinguished from other species with cream or pale brown blotches by the smaller size of its blotches. It can be distinguished from *albicoma albicoma*, *concinna* and *longiplaga* by the small size of the

blotch at the tornus of the fore wing, which does not extend to cover the discal spot in *lunicincta* (compare Pl. 1: 11, Figs 39, 41, 66 and 67). *Oospila lunicincta* can be distinguished from *albicoma nasuta* by the absence of a short, digitate extension of the blotch at the tornus of the fore wing (compare Figs 40 and 67).

The shape of the blotch at the apex of the fore wing distinguishes *lunicincta* from *depressa*. In *lunicincta* this blotch narrows towards the costa and does not fill the apex as it does in *depressa* (compare Pl. 1: 20, Figs 67 and 72).

The male genitalia of *lunicincta* can be recognised by the shape of the valva and the ampulla (Fig. 138). The female genitalia can be recognised by the presence of a pocket on each side of the ostium (Fig. 192).

DISTRIBUTION. The 6 specimens examined were collected in Peru, Paraguay, and Brazil.

MATERIAL EXAMINED. **Peru:** Divisoria, 1500 m, 1♂, 20–23.vi.1982 (Covell). **Paraguay:** *Paraguari:* Sapucay, 1♂ [holotype] 16.ix.03 (Foster). **Brazil:** *Minas Geraes:* Uberaba, 3♂ (Le Moult). *Rio de Janeiro:* Rio de Janeiro, 1♀, xi. (Smith).

Depositories. BMNH, CMNH, CVCJ.

*Oospila pellucida* Prout

(Figs 68, 139, 193)

*Oospila pellucida* Prout, 1916: 170; 1932: 56.

LECTOTYPE ♂, here designated, in BMNH.

Type locality: PERU. Label data: type; La Oroya, R[i]o Inambari, Peru, Sept[ember] 1904. 3100 ft, dry seas[on] (G. Ockenden); *Oospila pellucida* ♂ Prout type; Rothschild Bequest B[ritish] M[useum] 1939-1; Geometridae genitalia slide No. 15707 ♂. [Examined.]

♂, ♀ (Fig. 68). Fore wing length 11–14 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: dark green; blotches absent; markings brown. Fore wing: costa pale brown; band along termen narrow; discal spot small, brown. Hind wing: as fore wing; anterior discal spot small, white; posterior discal spot small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; with white area around crests enclosed by pink line, remainder cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite on intersegmental membrane of sterna A2 and A3 absent; sternum A8 of male strongly sclerotized, deeply excavated to form knobbed processes.

**GENITALIA ♂** (Fig. 139). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: ampulla large, robust, margin denticulate; sacculus extended into short, pointed projection. Anellar complex: surrounding aedeagus; ventrally V-shaped; dorsal component modified into an approximately rectangular plate with denticulate posterior margin. Vinculum: ventral plate squarish. Coremata absent. Aedeagus: short cornutus on vesica.

**GENITALIA ♀** (Fig. 193). Ostium: sterigma large. Bursa copulatrix: ductus bursae long, strongly sclerotized and striated, with entry point of the ductus seminalis expanded and sclerotized, antrum indistinct; corpus bursae large; signum small. Anterior apophyses short.

**DIAGNOSIS.** The band along the termen of *pellucida* is uniformly narrow and not expanded into blotches, which distinguishes it from *confluaria* and *dicraspeda* (compare Figs 42, 47 and 68). Males can also be distinguished from those of *confluaria* by the absence of a brush of long hair-like scales on the hind tibia.

*Oospila pellucida* can be distinguished from *lacteguttata* by the lack of blotches and by the absence of the proximal pair of spurs on the hind tibia.

The darker ground colour of the wings and the presence of a brown, not reddish, band along the termen distinguishes *pellucida* from *ciliaria*.

The male genitalia of *pellucida* can be recognised by the modification of the dorsal part of the anellar complex into a rectangular plate with a denticulate margin, and by the shape of the ampulla (Fig. 139). The female genitalia of *pellucida* can be recognised by the expansion and sclerotization of the ductus seminalis at the posterior of the ductus bursae (Fig. 193).

**DISTRIBUTION.** Four specimens were examined from Peru and two from Colombia.

**MATERIAL EXAMINED.** **Colombia:** *Risaralda:* Siato, Rio Siato, slopes of Choco, 1500 m, 2♀, ix.09. **Peru:** *Puno:* La Oroya, Rio Inambari, 400 m, 1♂ [lectotype], 1♂ [paralectotype] dry season, ix.1904 (*Ockenden*). Carabaya: Tinguri, 1000 m, 1♂ [paralectotype] dry season, viii.1904 (*Ockenden*). La Union, Rio Huacamayo, 610 m, 1♀ [paralectotype] wet season, xi.1904 (*Ockenden*).

*Depository:* BMNH.

# *Oospila ruptimacula* Warren

(Pl. 1: 18, Figs 69, 140, 194)

*Oospila ruptimacula* Warren, 1901: 448; Prout, 1912: 133; 1932: 58. Holotype ♂, in BMNH. Type locality: ECUADOR. Label data: Type; Paramba [3500 ft II.97 struck out]; 8b IIX IX; *Oospila ruptimacula* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939-I; Geometridae genitalia slide No. 15723 ♂. [Examined.]

*Oospila aliphera* Dognin, 1923: 20. Holotype ♂, in USNM. Type locality: BOLIVIA. Label data: Bolivia: Rio Songo, 750 m (*Fassl*); Genitalia slide By MAC 57762 USNM. [Examined.] **Syn.n.**

*Oospila ruptimacula aliphera* Dognin; Prout, 1933: 58.

*Oospila ruptimacula curtimacula* Prout, 1933: 58. **LECTOTYPE** ♂, here designated, in BMNH. Type locality: COLOMBIA. Label data: Type; Gorgona Island, Colombia, at light, 200 ft. 15.10.24. S[ain]t George Exped[it]io[n]. C. L. Collenette; Brit[ish] Mus[useum] 1925-488; Seitz VIII; *Oospila ruptimacula curtimacula* ♂ type Prout; Geometridae genitalia slide No. 15721 ♂. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 18, Fig. 69). Fore wing length 15–20 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface very dark green. Wings: ground colour very dark green; markings cream, with brown perimeters and brown irrorations. Fore wing: costa pale brown; blotch at apex rounded, connected to blotch at tornus by brown line along termen; blotch at tornus approximately rectangular or wedge-shaped, usually narrowing distally; discal spot absent. Hind wing: blotch at apex large, extending 1/2 length of termen, irrorations more concentrated at anterior, connected to blotch at tornus via dark brown line along termen; blotch at tornus long, narrow, extending 2/3 length of anal margin; no distinct blotch at anal margin; anterior discal spot small, white; posterior discal spot sometimes small, white, sometimes absent (as in form *curtimacula*). Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface green; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male emarginated.

**GENITALIA ♂** (Fig. 140). Uncus not extended. Socii large. Gnathos: not fused, not reduced.



Valva: deeply excavated; ampulla narrow, digitate, apex denticulate; sacculus extended into long, narrow, sclerotized process. Anellar complex: completely surrounding aedeagus; dorsal component extended to emarginated plate with denticulate apex. Vinculum: ventral plate broad, V-shaped. Coremata absent. Aedeagus: vesica with cornutus.

**GENITALIA ♀** (Fig. 194). Ostium: sterigma deeply excavated (deeper than in *decoloraria*, Fig. 136). Bursa copulatrix: ductus bursae long, strongly sclerotized and striated with large antrum, widening distally; corpus bursae small, spherical; signum small. Anterior apophyses short.

**DIAGNOSIS.** *Oospila ruptimacula* can be distinguished from other species with cream blotches by the presence of patches of concentrated dark brown irrorations within the blotches. The blotch at the apex of the hind wing is particularly dark in this respect. The shape of the blotch at the tornus of the fore wing distinguishes *ruptimacula* from *albicomma albicomma*, *concinna*, and *longiplaga*. In *ruptimacula* this blotch does not extend to cover the discal spot as it does in the others (compare Pl. 1: 11 and 18, Figs 39, 41, 66 and 69). *Oospila ruptimacula* can be distinguished from *albicomma nasuta*, *depressa*, and *lunicincta* by the size of the blotch at the tornus of the hind wing, which is much larger in *ruptimacula* (compare Pl. 1: 18 and 20, Figs 40, 67, 69 and 72).

The male genitalia of *ruptimacula* can be recognised by the shape of the valva and the modified form of the anellar complex (Fig. 140). The female genitalia can be recognised by the shape of the sterigma (Fig. 194).

**DISTRIBUTION.** This species is widely distributed in tropical Central and South America.

**MATERIAL EXAMINED.** **Belize:** Stann Creek: Stann Creek Valley, 1♀ (*Bilaux*). **Costa Rica:** *Alajuela:* Estacion Pitilla, 9 km South of Santa Cecilia, 700 m, 1♀, 18.v.1988 (*Janzen, Hallwachs*). *Puntarenas:* Fila Esquinas, 35 km South of Palmar Norte, 8°45'x83°20', 150 m, 2♂, 1♀, 7–8.i.1983 (*Janzen, Hallwachs*). *San Jose:* Estacion Carrillo, Parque Nacional Braulio Carrillo, 700 m, 1♂, viii.1984 (*Chacon, Chacon*); 1♂, iv.1985 (*Chacon, Chacon*). **Colombia:** *Cauca:* Gorgona Island, 60 m, 1♂ [lectotype of *ruptimacula curtimacula*] 15.x.24 (*Collenette*); 1♀ [paralectotype of *ruptimacula curtimacula*] 17.x.24 (*Collenette*); 1♂ [paralectotype of *ruptimacula curtimacula*] 21.xi.24 (*Collenette*); 1♂ [paralectotype of *ruptimacula curtimacula*]

[28].x.24 (*Collenette*). **Ecuador:** *Imbabura:* Paramba, 1♂ [holotype of *ruptimacula*]. *Chimborazo:* Chimbo, 1♀ (*Mathan*) 1.[ix].1892. **Peru:** *Huanuco:* Pozuzo, 1♀. *Madre de Dios:* Tambopata Reserve, 30 km South West of Puerto Maldonado, 300 m, 1♂, 16–22.x.1983 (*Covell*). *Puno:* South East Peru, La Oroya, Rio Inambari, 910 m, 1♂, dry season, v.1905 (*Ockenden*); 940 m, 2♂, wet season, iii.05 (*Ockenden*); South East Peru, Santo Domingo, 1800 m, 1♂, xi.1904 (*Ockenden*); South East Peru, 1♂; Yahuarimayo, 360 m, 1♀, v–vii.1912 (*Watkins*). **Peru:** *Cuzco:* Quincemil, 730 m, 1♂, viii.1962 (*Pena*). **Bolivia:** Rio Songo, 750 m, 1♂ [holotype of *aliphera*] (*Fassl*). **Brazil:** *Amazonas:* Fonte Boa, 1♂, v.1906 (*Klages*); Sao Paulo de Olivença, 1♂; Hyntanahan, Rio Purus, 2♂, iii.1922 (*Klages*).

**Depositories:** AMNH, BMNH, CMNH, CVCJ, INBio, USNM.

### *Oospila venezuelata* (Walker) **comb.n.**

(Pl. 1: 19, Figs 70, 141, 195)

*Comibaena venezuelata* Walker, 1861: 570. LECTOTYPE ♂, here designated, in BMNH. Type locality: VENEZUELA. Label data: 47g; Venezuela; 7. *Comibaena venezuelata*; South America; Type; Geometridae genitalia slide No. 15782 ♂. [Examined.]

*Comibaena venezuelata* Walker; Druce, 1892: 87. *Auophyllodes venezuelata* (Walker); Prout, 1912: 131; 1932: 53.

[*Auophyllodes venezuelata* ab. *connexa* Prout, 1932: 53 Infra-subspecific name.]

*Auophyllodes venezuelata cellata* Prout, 1932: 53. Holotype ♀, in BMNH. Type locality: MEXICO. Label data: Mexique oriental Tabasco W. Gugelmann, 1<sup>er</sup> trimestre 1914; Ex Oberthür Coll[ection] Brit[ish] Mus[eum] 1927–3; *Auophyllodes venezuelata cellata* ♀ type Prout; Geometridae genitalia slide No. 15786 ♀. [Examined.] **Syn.n.**

*Comibaena invasata* Walker, 1866: 1611; Druce, 1892: Table 49, Fig.18. Holotype ♂, in BMNH. Type locality: COLOMBIA. Label data: 65 86; S[an]ta Marta; *Comibaena invasata*; Type. [Examined.] Synonymized by Prout, 1932: 53.

*Auophyllodes invasata* (Walker); Prout, 1912: 131.

[*Auophyllodes venezuelata* ab. *invasata* Prout, 1932: 53. Infra-subspecific name.]

[*Auophylla invasata* ab. *perrupta* Warren, 1900: 132. Infra-subspecific name].

*Comibaena belisama* Druce, 1892: 87. Holotype

♂, in BMNH. Type locality: PANAMA. Label data: Type; V[olcan] de Chiriqui, 2–3000 ft. Champion; Godman-Salvin Col[lection] 1903–4. B[iologia] C[entrali] A[mericana] Lep[idoptera] Het[erocera]. Comibaena belisama, Druce; Comibaena belisama ♂ type Druce; Geometridae genitalia slide No. 15779 ♂ [Examined.] **Syn.n.**

*Auophyllodes belisama* (Druce); Prout, 1912: 131; 1932: 53.

*Auophylla ambusta* Warren, 1900: 131. Holotype ♂, in BMNH. Type locality: VENEZUELA. Label data: Type; Palma Sola, Venezuela. 96 (Whytman); Rothschild Bequest B[ritish] M[useum] 1939–I; auophylla ambusta type ♂ Warr[en]; Geometridae genitalia slide No. 15785 ♂. [Examined.]

*Auophyllodes ambusta* (Warren); Prout, 1912: 131; 1932: 53.

*Auophyllodes partita* Prout, 1912, 131; 1932: 53. Holotype ♀, in BMNH. Type locality: PANAMA. Label data: La Choerra, Panama. 1 IV to 15 V 98. C.H. Dolby-Tylor. 98–146; *Auophyllodes partita* type Prout; Geometridae genitalia slide No. 15780 ♀. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 19, Fig. 70). Fore wing length 9–12 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings varying in extent, cream with dark brown. Fore wing: costa pale brown; termen with blotches merged to form band of varying width, often broader at tornus; band sometimes cream along entire length (as in form *venezuelata*), usually cream proximally and dark brown distally (Pl. 1: 19), sometimes entirely dark brown (as in form *belisama*); discal spot usually a short brown line surrounded by cream area; cream area around discal spot may be continuous with cream area at tornus, sometimes discal spot reduced, occasionally absent. Hind wing: termen with blotches merged to form a broad band, colour as in fore wing; discal spot usually absent, occasionally a short brown line surrounded by a small white area. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 in male; sternum A8 in male not strongly sclerotized, simple.

GENITALIA ♂ (Fig. 141). Uncus a narrow bar,

not extended. Socii reduced. Gnathos not fused, components large, not curved. Valva: costa extended into curved projection with serrated margin; apex sometimes with short process (in larger specimens) or rounded (Fig. 141); ampulla absent; sacculus not extended. Anellar complex: V-shaped, not surrounding aedeagus. Vinculum: ventral plate V- or U-shaped. Coremata absent. Aedeagus: vesica with small cornutus.

GENITALIA ♀ (Fig. 195). Ostium displaced anteriorly, intersegmental membrane of sternum A7 and A8 extended; sterigma a rectangular bar with a short anteriorly-directed projection on each side. Bursa copulatrix: ductus bursae short, weakly sclerotized and not striated, antrum absent; corpus bursae with signum small. Anterior apophyses short.

DISTRIBUTION. Widely distributed throughout tropical Central and South America.

DIAGNOSIS. *Oospila venezuelata* is unlikely to be confused with any other species from its wing markings, but may be distinguished from *astigma* by the broader band along the termen of its hind wings (compare Pl. 1: 6 and 19, Figs 22 and 70). Males of these two species can also be distinguished by the shape of the anellar complex (compare Figs 97 and 141).

The female genitalia of *venezuelata* can be recognised by the displacement of the ostium and extension of the intersegmental membrane between sternum A7 and A8 (Fig. 195). The displacement of vein  $R_2$  in the fore wings such that its point of divergence from  $R_3$  lies distal to that of vein  $R_5$ , also distinguishes *venezuelata* from other species.

MATERIAL EXAMINED. **Mexico:** *Tabasco:* 1♀ [holotype of *venezuelata cellata*] 1<sup>st</sup> trimestre, 1914 (Gugelmann). *Veracruz:* Huatuxco, 1♀. *Quintana Roo:* X-can, Nueva, 140♂, 9♀, vii.1971, x.1973, viii.1975, viii.x.xi,xii.1980, i,ii,iii,iv,v,vi,vii,viii,ix,x,xi.1981 (Welling). **Guatemala:** South Geronimo, 2? (Champion). *Santa Rosa:* Barberena, 1♂. *Izabel:* Cayuga, 1♂ (Schaus, Barnes). *Sacatepequez:* Duenas, 1? (Champion). **Nicaragua:** Rio San Juan: Chontales, 1♂. **Costa Rica:** *Alajuela:* Cerro Campana, 650 m East side Volcan Cacao, 6 km North West Dos Rios, 1♂, 15.i.1988 (Janzen, Hallwachs). Finca San Gabriel, 2 km South West of Dos Rios, 600 m, 7♂, v.1989 (GNP Biodiversity Survey). *Guanacaste:* Estacion Mengo, South West side of Volcan Cacao, W85°28'10" N10°55'43", 1100 m, 1♂, ii.1988 (Janzen, Hallwachs); 4♂, 10.ii.1988 (Janzen, Hallwachs); 2♂,



vi.1988 (Janzen, Hallwachs). Casa Roberto, Estacion Pitilla, 7 km South of Santa Cecilia, W85°25'33" N11°00'18", 500 m, 2♂, v.1988 (GNP Biodiversity Survey); 2♂, i.1989 (GNP Biodiversity Survey). Estacion Pitilla, 9 km South of Santa Cecilia, 700 m, 1♂ (Moraga, Rios). Limon: Sixaola River, 1♂. San Jose: San Jose, 2♂, 2♀ (Schmidt). Panama: La Chorrera, 1♀ [holotype of *partita*] 1.iv–15.v.98 (Dolby-Taylor). Canal Zone: Corozal, near Balboa, 1♀, 20.vi.24 (Collenette). Chiriqui: Volcan de Chiriqui, 610–910 m, 1♂ [holotype of *belisama*] (Champion). 1♂ (Walker). Trinidad: Saint George East: Caparo, 1♀ (Birch). 1?, 10.vi–2.vii (Kaye); Arima Valley, 800–1200, 1♂, 1♀, 10–22.ii.1964 (Rozen, Wygodzinsky). Venezuela: 1♂ [lectotype of *venezuelata*]. Cucuta, 2♂, 1♀. Palma Sola: 1♂ [holotype of *ambusta*] 1896 (Whytmann); 1♂ [paralectotype of *venezuelata*]; 1♀, 1896 [paralectotype of *venezuelata*] (Whytmann); 1♀ (Whytmann); 1♂, 4♀. Carabobo: Valencia, 1♂; San Esteban, near Pueno-Cabello, 1♂ (Sagan). Distrito Federal: Caracas, 1♂. Colombia: Boyaca: Muzo, 400–800 m, 5♂ (Fassl). Magdalena: Santa Marta, 1♂ [holotype of *invasata*]; Suert Cabel, 1?, 76 (Smith); Minca, 610 m, 1♂ (Smith); Don Amo, 610 m, 1♂ (Smith); 1♂. Bonda, 0 m, 1♂ (Smith). Meta: East Colombia, Upper Rio Negro, 800 m, 6♂ (Fassl). Peru: 1♂. Bolivia: Santa Cruz: East Bolivia, Buenavista, 750 m, 1♂, viii.06–iv.07 (Steinbach). Cochabamba: Charaplaya, 65°W 16°S, 1300 m, 1♂, iv.01 (Simons); 1♂ (Germain).

Depositories: AMNH, BMNH, INBio.

### *Oospila confundaria* (Möschler)

(Figs 71, 142, 196)

*Racheospila confundaria* Möschler, 1890: 242. LECTOTYPE ♀, here designated, in MNHU. Type locality: PUERTO RICO. Type; Portorico, Mus[eum] Berlin; Confundaria Moschl[er]; MAC genitalia slide No. 018; [Examined.]

*Oospila confundaria* (Möschler); Prout, 1912: 133; 1932: 55.

*Racheolopha coerulea* Warren, 1906: 421. Holotype ♂, in USNM. Type locality: GUYANA. Label data: British Guiana: Omai; Schaus Coll[ection]; Type No. 9188 U.S.N.M.; Genitalia Slide By MAC No. 57731 U.S.N.M. [Examined.] Syn.n.

*Oospila coerulea* (Warren); Prout, 1912: 134; 1932: 55.

*Oospila coerulea aphenges* Prout, 1932: 55. Holotype ♂, in BMNH. Type locality: BRAZIL.

Label data: Type H[olo]t[ype]; 39. 27. Urum, 15 miles S[outh] of Corumba. 650 ft, 16–23.xi.27. Mato Grosso. C.L. Collenette; 3174; *Oospila coerulea aphenges* ♂ type Prout; Joicey Bequest. Brit[ish] Mus[eum] 1934–120; Geometridae genitalia slide No. 15695. [Examined.] Syn.n.

*Racheolopha derasa* Warren, 1906: 422. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean, vii. 1904; Schaus Coll[ection]; Type No. 9191 U.S.N.M.; Genitalia Slide By MAC No. 57730 U.S.N.M. [Examined.] Syn.n.

*Oospila derasa* (Warren); Prout, 1912: 134; 1932: 55.

*Oospila sesqui-plaga* Prout, 1912: 135; 1932: 55. Holotype ♀, in HECO. Type locality: BRAZIL. Label data: Holotype; Brazil; ns; t., 1910, L.B. Prout; 647; [blank green label]; *Oospila sesqui-plaga* Prout type; Type Lep: No. 2519 *Oospila sesqui-plaga* Prout Hope Dept. Oxford. [Examined.] Syn.n.

♂, ♀ (Fig. 71). Fore wing length 10–15 mm. Antenna of female simple. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; markings dark brown. Fore wing: costa pale brown; blotch at apex usually absent, sometimes present but very small (as in form *sesqui-plaga*); blotch at tornus often small (as in form *derasa*), sometimes absent; termen unmarked or sometimes with narrow brown band along its length; discal spot brown. Hind wing: blotch at apex absent; blotch at tornus usually absent, sometimes present but very small; blotch at anal margin absent; anterior discal spot usually absent, sometimes small, white; posterior discal spot usually absent, sometimes small, brown. Hind leg: proximal spurs absent; brush of long hair-like scales on male tibia. Abdomen: basal crests dark brown, distal crests paler; cream area surrounding crests; remainder of dorsal surface green; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite present on intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized, bifid.

GENITALIA ♂ (Fig. 142). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: cleft; broad apically; ampulla narrow, curved, articulating close to base of valva, lacking teeth; sacculus lobed with very short, pointed apical extension. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate con-

spicuously narrow, V-shaped. Coremata absent. Aedeagus curved; vesica with small cornutus.

**GENITALIA** ♀ (Fig. 196). Ostium: sterigma large, elliptical. Bursa copulatrix: ductus bursae long, not strongly sclerotized, weakly striated, antrum indistinct; corpus bursae large; signum large. Anterior apophyses long.

**DIAGNOSIS.** *Oospila confundaria* has similar wing markings to *decoloraria* (compare Figs 64 and 71) from which males can be distinguished by the presence of a hair pencil on the hind tibia of *confundaria* and females can be distinguished by the simple antennae of *confundaria*. *Oospila confundaria* can be distinguished from *marginata*, *tricamerata*, and *obsolescens* by the smaller size of the wing blotches or their absence, and by the absence of large brown discal spots on the hind wings (compare Pl. 1: 16, Figs 54–56 and 71).

**DISTRIBUTION.** *O. confundaria* is the most widely distributed species of *Oospila* occurring throughout the tropical areas of Central and South America and on many Caribbean islands.

**REMARK.** The abdomen of the holotype of *O. sesquiplaga* is incorrectly associated.

**MATERIAL EXAMINED.** **Cuba:** Matanzas: Cienaga, Zapata, near Playa Larga, 1♀. **Jamaica:** Baron Hill, Trelawny, 1♀. **Dominican Republic:** La Vega, 15 km North Jarabacoa, 240 m, 1♀, 21.vii.1987 (Rawlins, Davidson). **Puerto Rico:** 1♀ [lectotype]. **St. Lucia:** 1♀ (*Br[a]nch*). **Trinidad:** Curepe, 9.i.1980, 1♂ (*Cock*). **Guatemala:** Chejel, 1♂. **Izabel:** Cayuga, 2♀. **Costa Rica:** Avangarez, 2♂. **Alajuela:** Finca San Gabriel, 2 km South West of Dos Rios, 600 m, W85°23'50" N10°53'19" 1♀, i.1988 (Janzen, Hallwachs); Estacion Pitilla, 700 m, 9 km South Santa Cecilia, 1♂, 18.vi.1988 (Janzen, Hallwachs); 1♀, vi.1988 (*Espinosa*); 1♀, vii.1988 (*Espinosa, Chaves*); 3♂, 1♀, viii.1988 (*Scoble, Brooks*); Finca La Campana, El Ensayo, 7 km West Dos Rios, 1♂. **Cartago:** Juan Vinas, 1♀. **Guanacaste:** Las Canas, Rio Carobici, 1♀. Casa Oeste, Cerro El Hacha, 12 km South East La Cruz, 300 m, 2♀, x.1987 (*Chacon*); 1♂, 2♀, xi.1987 (*Chacon*); Cerro El Hacha, 300 m, 12 km South East La Cruz, 1♂, 1♀; Derrumbe, Estacion Mengo, 1400 m, West side Volcan Cacao, 1♀; Estacion Mengo, 1100 m, South West side of Volcan Cacao, W85°28'10" N10°55'43" 1♂, vi.1988 (Janzen, Hallwachs); 1♂, 3♀ (Janzen, Hallwachs); Finca Jenny, 300 m, 31 km North Liberia, 2♂, 3♀; Santa Rosa National Park, 300 m, 3♀, 6.vi.1978 (Janzen); 1♂, 12.vi.1978 (Janzen);

2♂, 1♀, 2.vii.1978 (Janzen); 1♂, 12.xii.1978–10.i.1979 (Janzen); 1♀, 18–20.v.1979 (Janzen, Hallwachs); 1♀, 19–21.vi.1979 (Janzen, Hallwachs); 1♀, 22–24.vi.1979 (Janzen); 1♂, 27–30.vi.1979 (Janzen); 1♂, 10–12.xi.1979 (Janzen); 1♂, 1♀, 23–25.xi.1979 (Janzen, Hallwachs); 1♂, 26–28.xi.1979 (Janzen); 1♀, 7–9.xii.1979 (Janzen, Hallwachs); 1♀, 21–24.xii.1979 (Janzen); 2♂, 2–11.iii.1980 (Janzen, Hallwachs); 2♀, 1.v.1980 (Janzen, Hallwachs); 1♀, 5–6.v.1980 (Janzen, Hallwachs); 1♂, 1♀, 9–11.v.1980 (Janzen, Hallwachs); 2♀, 16–18.vii.1980 (Janzen, Hallwachs); 1♀, 9–17.iii.1981 (Janzen, Hallwachs); 1♀, 1–5.i.1982 (Janzen, Hallwachs); 1♂, 1–15.i.1982 (Janzen, Hallwachs); 2♀, 10–20.iii.1982 (Janzen, Hallwachs); 1♂, xii.1982 (Janzen, Hallwachs); 300 m, 6♂, 1♀, i.1983 (Janzen, Hallwachs); 1♂, ii.1983 (Janzen, Hallwachs); 2♀, iii.1983 (Janzen, Hallwachs); 1♀, 3.vi.1983 (Janzen, Hallwachs); 1♂, 1♀, iv.1984 (Janzen, Hallwachs); 1♂, 2♀, v.1984 (Janzen, Hallwachs); 1♂, 15–17.iii.1986 (Janzen, Hallwachs); 4 km East Casetilla, Rincon National Park, 1♀, 14.ii.1983 (Janzen, Hallwachs); Estacion Maritza, 600 m, West side Volcan Orosi, 1♂, v.1988 (GNP Biodiversity Survey); Finca Jenny, 30 km north Liberia, W85°34'27" N10°51'55" 1♂, xii.1987 (GNP Biodiversity Survey); 1♂, i.1988 (GNP Biodiversity Survey); 1♂, 3♀, viii.1988 (GNP Biodiversity Survey). **Heredia:** Chilamate, Heredia, 2♂, 1♀, 9.viii.1986 (*Covell*). **Limon:** Sixaola River, 2♂; Cerro Tortuguero, Parque Nacional Tortuguero, 100 m, 3♂, 2♀ iv.1989 (*Aguillar, Solano*); 1♂, x.1989 (*Solano*). **Puntarenas:** Fila Esquinas, 35 km South of Palmar Norte, 150 m, 8°45' × 83°20', 1♂, 7–8.i.1983 (Janzen, Hallwachs). **Panama:** Veraguas: Veragua, 1♂. **French Guiana:** Guyane: St. Jean du Maroni, 1♂ [holotype of *derasa*]; 12♂, 13♀ (*Le Mout*); St. Laurent du Maroni, 1♂, 1923 (*Aymès*); 7♂, 3♀; Nouveau Chantier, 1♂; 1♀ (*Bar*). **Surinam:** Sipalawini: Thibiti area, Kabo Creek (partly swampy, primary forest on hilly slopes circa 2 km from river), 2♀. **Guyana:** Bought at Georgetown, 1♂. **Mazaruni-Potaro:** Omai: 1905, 1♂ [holotype of *coerulea*] 1♂, 11♀; Tumatumari, 1♂, xii.1907 (*Klages*); Kartabo Point, 1♂, 1♀. **East Demerara-West Coast Berbice:** Rockstone, Essequibo, 1♀. **Venezuela:** Bolivar: Maripa, Caura River, 1♂ (*Klages*). Anacoco, 60 m, 1♂. Guririo Caroni, 100 m, 1♂. 88 km South El Dorado, 1♂, 26–28.vi.1984, 1♂ (*Covell*); Las Clarita, 1♂, 1♀, 28.vi.1984 (*Covell*). **Lara:** Canon Panzacola, Guarico, 1♂. Guarico, Hato Masaguaral, 45 km South Calabozo, 1♂, 1♀. **Colombia:** Meta: East Colombia:



Upper Rio Negro, 800, 1♂; 1♂. **Peru:** *Madre de Dios:* Tambopata Reserve, 300 m, 30 km South West Puerto Maldonado, 6 ♂, 16–22.x.1983 (Covell). **Bolivia:** *Santa Cruz:* River Yapacani, 600 m, 1♂. **Paraguay:** *Amambay:* Parque Nacional Cerro Cora, 1♂. *Paraguai:* Sapucay, 1♂, 6.ix.02 (Foster); 1♂, 30.x.04 (Foster); 26.2 km South East Ybycui, Parque Nacional Ybycui, 3♂. **Brazil:** *Minas Geraes:* Uberaba, 1♂ (*Le Moul*). East Brazil: Tutaya, 2 ♂ (*Moss*); 1♀ [holotype of *sesqui-plaga*]. Perambuca, 4♂. *Acre:* Rio Jurua, 4°40'S 66°40'W, 1♂, 20.x.74. *Amazonas:* Humayta, River Madeira, 1♂; Sao Paulo de Olivença, 1♂. Bauru, Sao Paulo, 1♂. *Mato Grosso do Sul:* 15 miles South Corumba, Urum, 200 m, 1♂ [holotype of *coerulea aphenges*] 23.xi.27 (Collenette); Burity, 30 miles North East of Cuyaba, 690 m, 2♂, 1–14.vii.27 (Collenette); 6 ♂, 1886 (*Germain*); Tombador, 16 miles South of Diamantino, 460 m, 1♂, 20–27.viii.27 (Collenette). *Para:* Unt. Amaz. Taperinha: below Santarem, 1♂, 21–31.viii.1927 (*Zerny*); 1♂, 1♀, 1–7.ix.27. *Rondonia:* Calama, River Madeira, below River Machados, 1♂, viii–x.07 (*Hoffmann*). *Rio de Janeiro:* Rio de Janeiro, 1♂, x. *Santa Catarina:* Santa Catarina, Nova Bremen, 850 m, 1♂, xi.37 (*Hoffmann*). *Sao Paulo:* Alto de Serra, Santos, 800 m, 1♀, 3.xii.12.

*Depositories:* BMNH, CMNH, CVCJ, HECO, INBio, MDHG, MNHU, UCVN, USNM.

### *Oospila depressa* Warren

(Pl. 1: 20, Figs 72, 143, 197)

*Oospila depressa* Warren, 1905: 45; Prout, 1912: 133; 1933: 58. LECTOTYPE ♀, here designated, in BMNH. Type locality: COSTA RICA. Label data: Type; Tuis, Costa Rica; *Oospila depressa* type ♀ Warr[en]; isthoxia; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15719 ♀. [Examined.]

*Oospila semiviridis* Warren, 1909: 84; Prout, 1912: 134; 1933: 57. Holotype ♂, in BMNH. Type locality: PERU. Label data: Type; La Oroya R[io] Inambari, S[outh] E[ast] Peru, 3100 ft, wet s[eason], March 05. (G. Ockenden); *Oospila semiviridis* type ♂ Warr[en]; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 15716 ♂. [Examined.] **Syn.n.**

♂, ♀ (Pl. 1: 20, Fig. 72). Fore wing length 11–15 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: ground colour dark green; blotches cream or pale brown, with

dark brown striations and perimeters. Fore wing: costa pale brown; blotch at apex of variable size, rounded, extending to costa, not connected to blotch at tornus via termen; blotch at tornus variable in size, but never large enough to cover discal spot; discal spot small, brown. Hind wing: blotch at apex large; blotch at tornus smaller, approximately circular; blotch at anal margin reduced to small lip; discal spot white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; with pink and brown flecks around crests, remainder of dorsal surface cream; sternum A2 of male with brushes of long hair-scales present; elliptical sclerite present on intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized, deeply emarginated.

**GENITALIA** ♂ (Fig. 143). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: cleft; ampulla short, with serrated apical margin; sacculus extended into narrow, sclerotized process. Anellar complex: completely surrounding aedeagus, extended posteriorly into tongue-shaped process. Vinculum: ventral plate V-shaped. Coremata absent. Aedeagus: vesica rarely with small cornutus.

**GENITALIA** ♀ (Fig. 197). Ostium: sterigma rectangular. Bursa copulatrix: ductus bursae strongly sclerotized and striated, antrum absent; corpus bursae small, spherical; signum quite large. Anterior apophyses short.

**DIAGNOSIS.** *Oospila depressa* can be distinguished from *albicoma albicoma* and *concinna* by the shape and extent of the blotch at the tornus of the fore wing. In *depressa* this blotch is smaller, never extends to cover the discal spot and is wedge-shaped, tapering gradually towards the termen, and never with an abrupt constriction (compare Pl. 1: 11 and 20, Figs 39, 41 and 72). The absence of a digitate extension of the blotch at the tornus of the fore wing distinguishes *depressa* from *albicoma nasuta* (compare Pl. 1: 20, Figs 40 and 72).

The small, approximately circular blotch at the tornus of the hind wing in *depressa* distinguishes it from *longiplaga* in which this blotch is longer and approximately rectangular (compare Pl. 1: 20, Figs 66 and 72). The large blotch at the apex of the fore wing distinguishes *depressa* from *lunicincta* (compare Pl. 1: 20, Figs 67 and 72).

The male genitalia of *depressa* can be recognised by the small tongue-shaped posterior extension of the anellar complex (Fig. 143). The female genitalia can be recognised by the distinc-

tive shape of the sterigma (Fig. 197).

**DISTRIBUTION.** Material was examined from Guatemala, Belize, Costa Rica, Panama, Venezuela, Peru and Bolivia.

**MATERIAL EXAMINED.** **Guatemala:** *Izabel:* Cayuga, 1♀, vi. (Schaus and Barnes); 1♂, 3♀; 1♂, v. (Schaus, Barnes); Chejel, 1♂, 1♀; near Matias de Galvez, 1♀; Quirigua, 1♀. **Belize:** Belize, 1♀; Rio Grande, 1♂, xii.1932 (White); 1♀. **Toledo:** Punta Gorda, 1♀ x.1935 (White). **Costa Rica:** Canta Rana, 300 m, 1♀ (Herbulot). **Cartago:** Tuis, 1♀ [lectotype of *depressa*]; 2♀ [paralectotypes of *depressa*]; Sitio 1♀, v; Juan Vinas, 760 m, 1♂, v. (Schaus); 3♂, 1♀; Moravia de Chirripo, 1000 m, 1♀, 10.v.1983 (Janzen, Hallwachs). **Guanacaste:** Rincon National Park, 4 km East Casetilla, 750 m, 1♀, 22.v.1982 (Janzen, Hallwachs); 1♂, 8.x.1982 (Janzen, Hallwachs); 4 km East Casetilla 750 m, 1♂, 11.iv.1983 (Janzen, Hallwachs); Mirador Ad., 900 m, 1♀, 29.iii.1984 (Janzen, Hallwachs); 4 km West Station Cecilia, 250 m, 1♂, 25.ii.1985 (Janzen, Hallwachs); 2 km South-West Station Cecilia, 300 m, 1♂, 25.xii.1984. **Heredia:** La Selva Biological Station, Puerto Viejo de Sarapiquí, 40 m, 1♀, iv.1987 (Chavarría). **Limon:** Cerro Tortuguero, North edge Tortuguero National Park, 0–100 m, 2♀, 30.v.1984 (Janzen, Hallwachs); Guapiles, 1♀. **Osa Peninsula:** Sirena Corcovado National Park, 2♂, 5–11.i.1981 (Janzen, Hallwachs). **Puntarenas:** San Vito, 1♀; Fila Esquinas, 35 km South of Palmar Norte, 8°45' × 83°20', 1♀, 7–8.i.1983 (Janzen, Hallwachs). **San Jose:** Estacion Carrillo, Parque Nacional Braulio Carrillo, 700 m, 1♀, ix.1984 (Chacon, Chacon); 2♂, x.1984 (Chacon, Chacon); 1♂, i.1985 (Chacon, Chacon); 1♂, iii.1985 (Chacon, Chacon); 1♂, 1♀; Fila Esquinas, 35 km South of Palmar Norte, 150 m, 1♀, 7–8.i.1988 (Janzen, Hallwachs). **Panama:** **Chiriqui:** Volcan de Chiriqui, 60–90 m, 1♀ (Champion); Lino, 1♀; Oja de Agua, 1600 m, 1♀ (Herbulot); Environs de Estacion Clara, 1♂ (Herbulot); 15 km Norte Oeste de El Hato del Volcan, 1400 m, 1♀ (Herbulot). **Canal Zone:** Barro Colorado Island, 2♀. **Venezuela:** **Aragua:** Rancho Grande, 1♀, 28.vi–18.vii.1974 (Watson); 1♂, 12.vii–16.viii.1976 (Watson). **Bolivar:** 88 km South El Dorado, Estado Bolivar, 150 m, 1♂, 26–28.vi.1984 (Covell). **Peru:** **Puno:** La Oroya, Rio Inambari, 940 m, 1♂, dry season, ix.04 (Ockenden); 1♀, wet season, x.1904 (Ockenden); 1♂ [holotype of *semiviridis*] wet season, iii.05 (Ockenden); Carabaya, Rio Huacamayo, 940 m, 1♂, dry season, vi.04 (Ockenden).

**Bolivia:** **Santa Cruz:** East Bolivia: Buenavista, 1♀, vii–x.1906 (Steinbach); Provincia del Sara, 450 m, 1♀, xi.1909 (Steinbach).

**Depositories:** BMNH, CMNH, HERB, INBio, USNM.

### *Oospila stagonata* (Felder and Rogenhofer) **comb.n.**

(Figs 73, 144, 198)

*Racheospila stagonata* Felder and Rogenhofer, 1875: pl. 127, fig 25. Holotype ♂, in BMNH. Type locality: COLOMBIA: Bogota. Label data: Lindig 1804; Type; 144; Novara CXXVII f25 *Racheospila stagonata* Bogota ♂; Progonodes *stagonata* Feld.; Rothschild Bequest B[ritish] M[useum] 1939–I; Geometridae genitalia slide No. 12932 ♂.

*Progonodes stagonata* (Felder & Rogenhofer); Warren, 1897: 430; Prout, 1912: 135; 1932: 60.

*Racheospila arycanda* Druce, 1892: 89 Holotype ♂, in BMNH. Type locality: COSTA RICA. Label data: Type; R[iver] Sucio, Costa Rica, H. Rogers; Godman-Salvin Coll[ection] 1903–4 B[iologia] C[entrali-] A[mericana]. Lep[idoptera-]Het[erocera]. *Racheospila arycanda* Druce; *Racheospila arycanda* ♂ type Druce; Geometridae genitalia slide No. 15772 ♂. [Examined.] **Syn.n.**

*Progonodes arycanda* (Druce); Prout, 1912: 135.

*Progonodes stagonata arycanda* (Druce); Prout, 1933: 60.

♂, ♀ (Fig. 73). Fore wing length 12–17 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface pale green. Wings: pale green; speckled with white. Fore wing: costa pale brown; discal spot usually absent, occasionally small, brown. Hind wing: anterior and posterior discal spots small, white. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface cream; male lacking brushes of long hair-scales on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 strongly sclerotized in male, bilobed.

**GENITALIA** ♂ (Fig. 144). Uncus short. Socii large. Gnathos: not fused, not reduced. Valva: short, narrow; costa with small subapical projection; ampulla absent; sacculus not extended. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate emarginated. Coremata absent. Aedeagus: vesica without cornutus.

**GENITALIA** ♀ (Fig. 198). Ostium: sterigma



absent. Segment A8 enlarged and strongly sclerotized. Bursa copulatrix: ductus bursae and corpus bursae form large, weakly sclerotized complex with some striations, antrum absent; signum small. Anterior apophyses absent.

**DIAGNOSIS.** *Oospila stagonata* can be distinguished from *holochroa* and *immaculata* by the presence of white speckling on its wings (compare Figs 34, 61 and 73). The wings of *stagonata* have a more mottled appearance than they do in *lactecincta*, *sporadata*, *athena* and *nivetacta*, and they lack the solid green and white patches (compare Pl. 1: 9 and 21, Figs 33, 35, 36, 73 and 74). The female genitalia of *stagonata* can be recognised by the enlargement and strong sclerotization of sternum A8 (Fig. 198).

**DISTRIBUTION.** Specimens were examined from Costa Rica, Colombia, Ecuador, and Venezuela.

**MATERIAL EXAMINED.** **Costa Rica:** Cartago: Orosi, 1200 m, 2♀ (*Fassl*). Limon: Rio Sucio, 1♀ [holotype of *arycanda*] (*Rogers*). **Colombia:** Cundinamarca: Bogota, 1♂ [holotype of *stagonata*] (*Lindig*), 1♀. **Ecuador:** Ita[i], 1♂ (*Buckley*). **Venezuela:** Bolivar: Carret Caicara, San Juan de Manapiare km 170, 300 m, 1♀, 4–9.iv.1977 (*Bordon*); Carret Bramor Delicias, 1800 m, 1♀, 16–17.vii.1980. **Ecuador:** Pichincha: Tinlandia, 17 km SE Santo Domingo de los Colorados, 900 m, 1♀, 16.x.1988 (*Miller*).

*Depositories:* AMNH, BMNH, UCVN.

### *Oospila nivetacta* (Warren) **comb.n.**

(Pl. 1: 21, Figs 74, 145, 199)

*Racheolopha nivetacta* Warren, 1906: 425. Holotype ♂, in USNM. Type locality: FRENCH GUIANA. Label data: French Guiana: Maroni R[iver], S[ain]t Jean, iv. 1904 (Sch Colombial); Type No. 9199 U.S.N.M. [Examined.]

*Progonodes nivetacta* (Warren); Prout, 1912: 135; 1932: 60.

♂, ♀ (Pl. 1: 21, Fig. 74). Fore wing length 10–16 mm. Antenna of female bipectinate. Frons and vertex brown. Interantennal fillet white. Thorax: dorsal surface dark green. Wings: mainly white, with dark green speckling concentrated at distal areas leaving central white patch. Fore wing: costa dark brown; discal spot large, brown. Hind wing: discal spot brown. Hind leg: proximal spurs absent; brush of long hair-like scales absent. Abdomen: basal crests dark brown, distal crests paler; remainder of dorsal surface green; male lacking brushes of long hair-scales

on sternum A2; elliptical sclerite absent from intersegmental membrane of sterna A2 and A3 of male; sternum A8 of male strongly sclerotized in male, narrowing posteriorly; emarginated.

**GENITALIA** ♂ (Fig. 145). Uncus not extended. Socii large. Gnathos: not fused, not reduced. Valva: deeply cleft; ampulla absent; sacculus extended into long, pointed process. Anellar complex: completely surrounding aedeagus. Vinculum: ventral plate broad, emarginated. Coremata absent. Aedeagus narrow; vesica with small cornutus.

**GENITALIA** ♀ (Fig. 199). Ostium: sterigma absent. Bursa copulatrix: ductus bursae short, strongly sclerotized, not striated; antrum indistinct; corpus bursae large; signum small. Anterior apophyses short.

**DIAGNOSIS.** *Oospila nivetacta* can be distinguished from other species of *Oospila* with green and white speckled wing markings by the dark brown colour of the costa, and the prominence of the brown discal spots (compare Pl. 1: 9 and 21, Figs 33, 35, 36, 73 and 74). The male genitalia of *nivetacta* can be recognised by the shape of the valva (Fig. 145).

**DISTRIBUTION.** This species has been collected in French Guiana, Guyana, Venezuela and Brazil.

**MATERIAL EXAMINED.** **French Guiana:** Guyane: St. Jean du Maroni, 1♂ [holotype]; 1♂ (*Le Mout*). **Guyana:** Mazaruni-Potaro: Rio Potaro, 1♂, i.1908 (*Klages*); 1♀. Potaro, 1♂, ii.1908 (*Klages*). Tumatumari, 1♂, xii.1907 (*Klages*). **Venezuela:** El Boninche res, Forestal Imataca, 200 m, 2♂, 6–13.xii.74. **Bolivar:** El Horniguero Meseta de Nuria, 500 m, 1♂, 13–17.xii.74. **Brazil:** Amazonas: Upper Amazonas: Fonte Boa, 2♂, v.1906 (*Klages*); 1♂, vii.07; Sao Paulo de Olivença: 1♂, i.1932 (*Wucherpennig*); 1♂, vi–vii.1933 (*Moss*); 1♀, vii.1934 (*Waehner*); Nova Olinda, Rio Purus, 1♂, v.1922 (*Klages*). **Amapa:** Para, 2♂ (*Moss*).

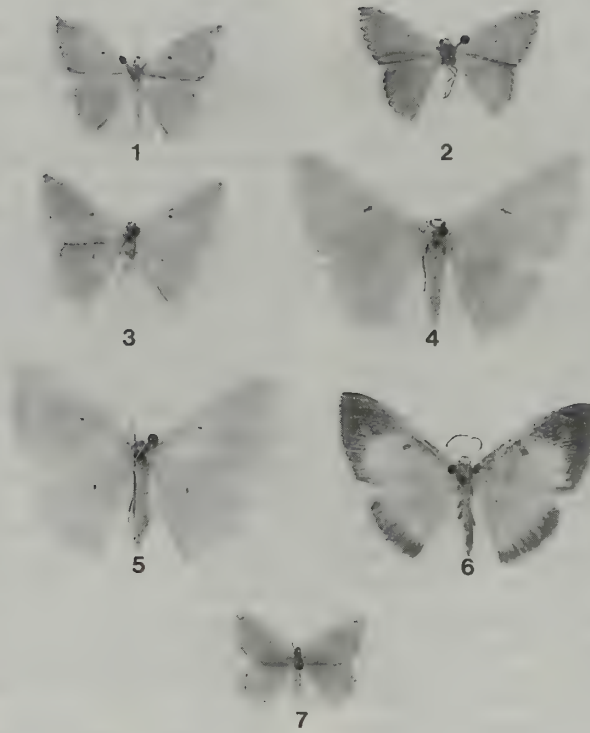
*Depositories:* BMNH, CMNH, UCVN.

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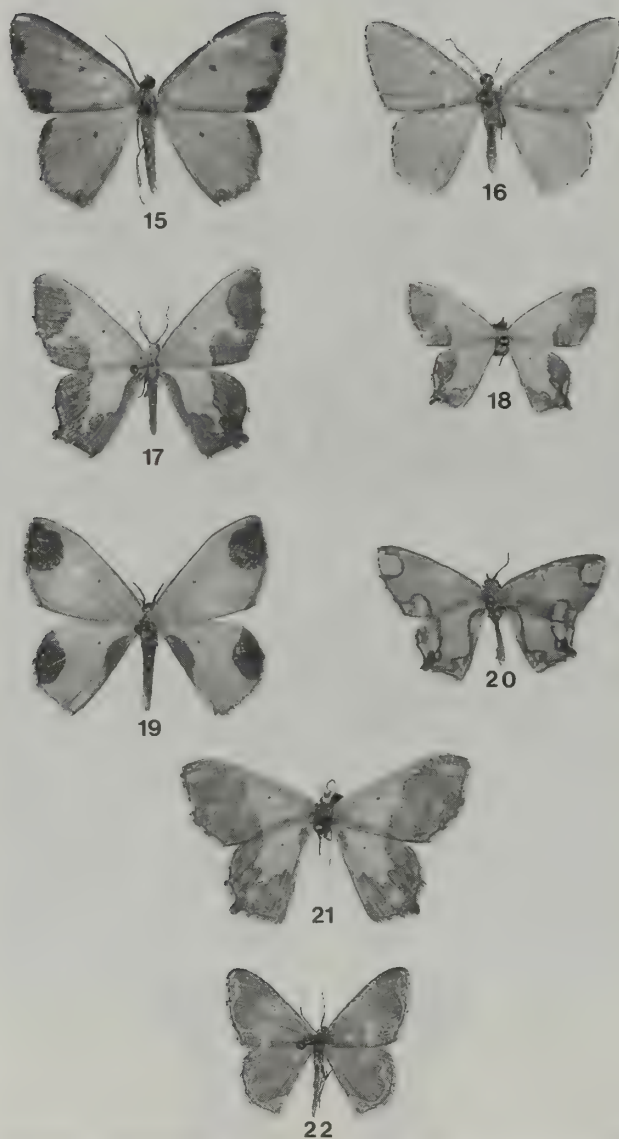


**Figs 1–7** *Oospila* species. 1, *O. flavilimes*; 2, *O. decorata*; 3, *O. nigripunctata*; 4, *O. permagna*; 5, *O. pallidaria*; 6, *O. subaurea*; 7, *O. acymanta*.

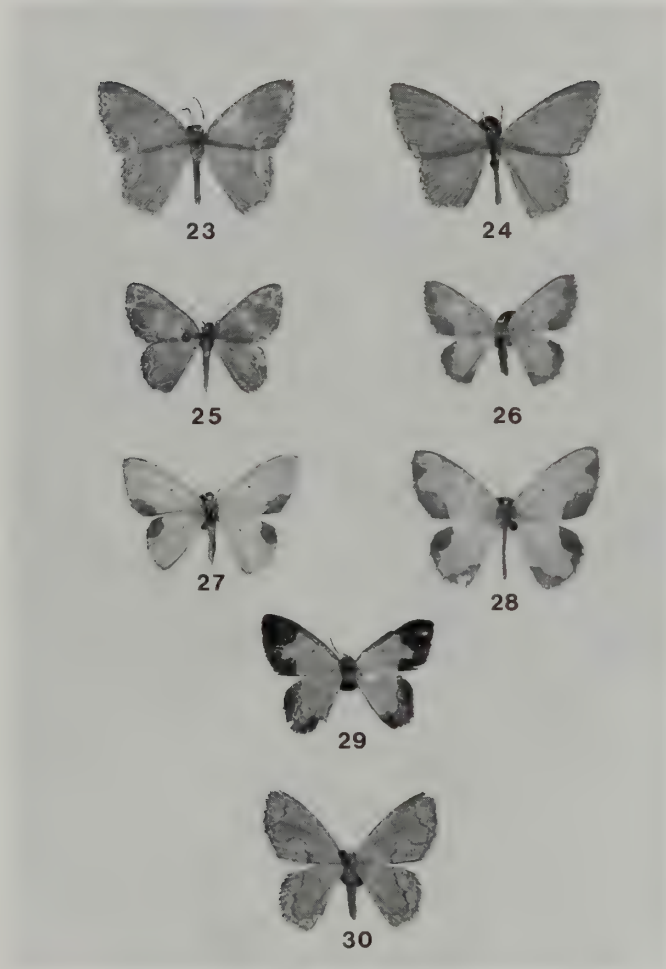


**Figs 8–14** *Oospila* species. 8, *O. quinquemaculata*; 9, *O. continuata*; 10, *O. excrescens*; 11, *O. florepicta*; 12, *O. semispurcata*; 13, *O. rhodophragma*; 14, *O. granulata*.



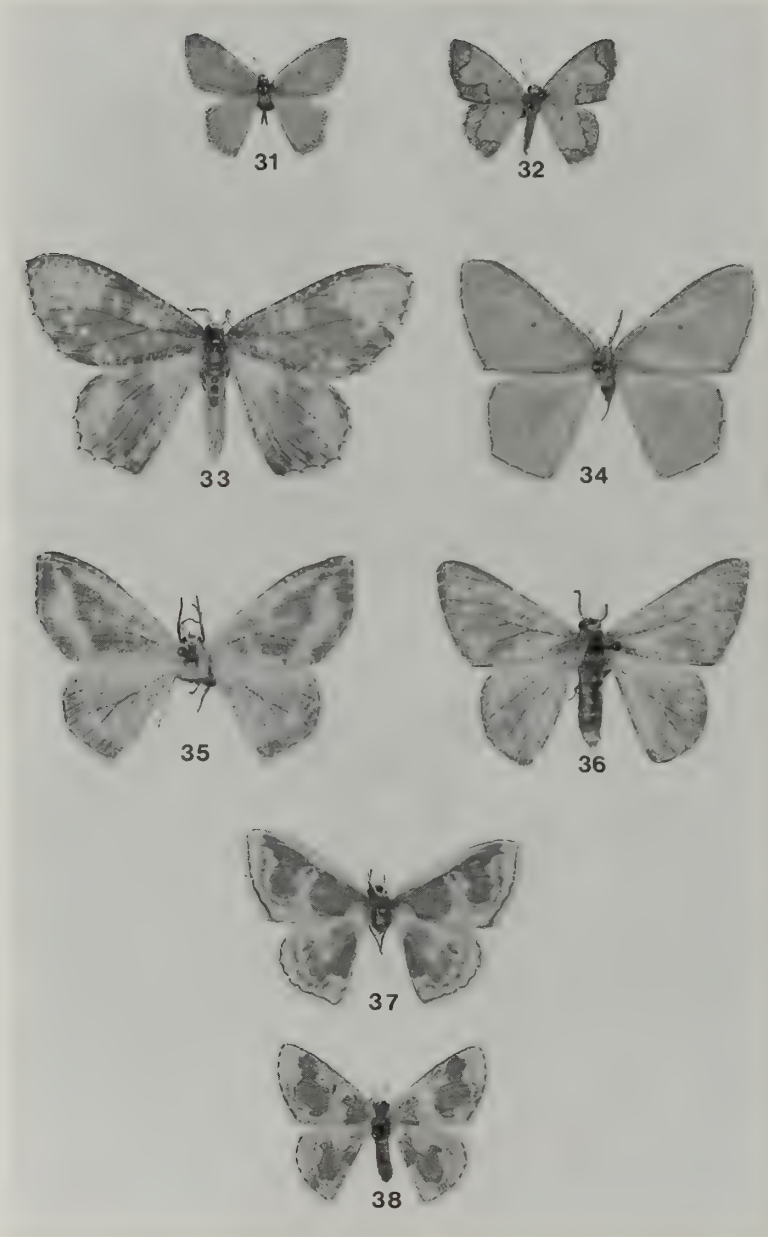


**Figs 15–22** *Oospila* species. 15, *O. thalassina*; 16, *O. lacteguttata*; 17, *O. asmura*; 18, *O. circumsessa*; 19, *O. rosipara*; 20, *O. delphinata*; 21, *O. camilla*; 22, *O. astigma*.

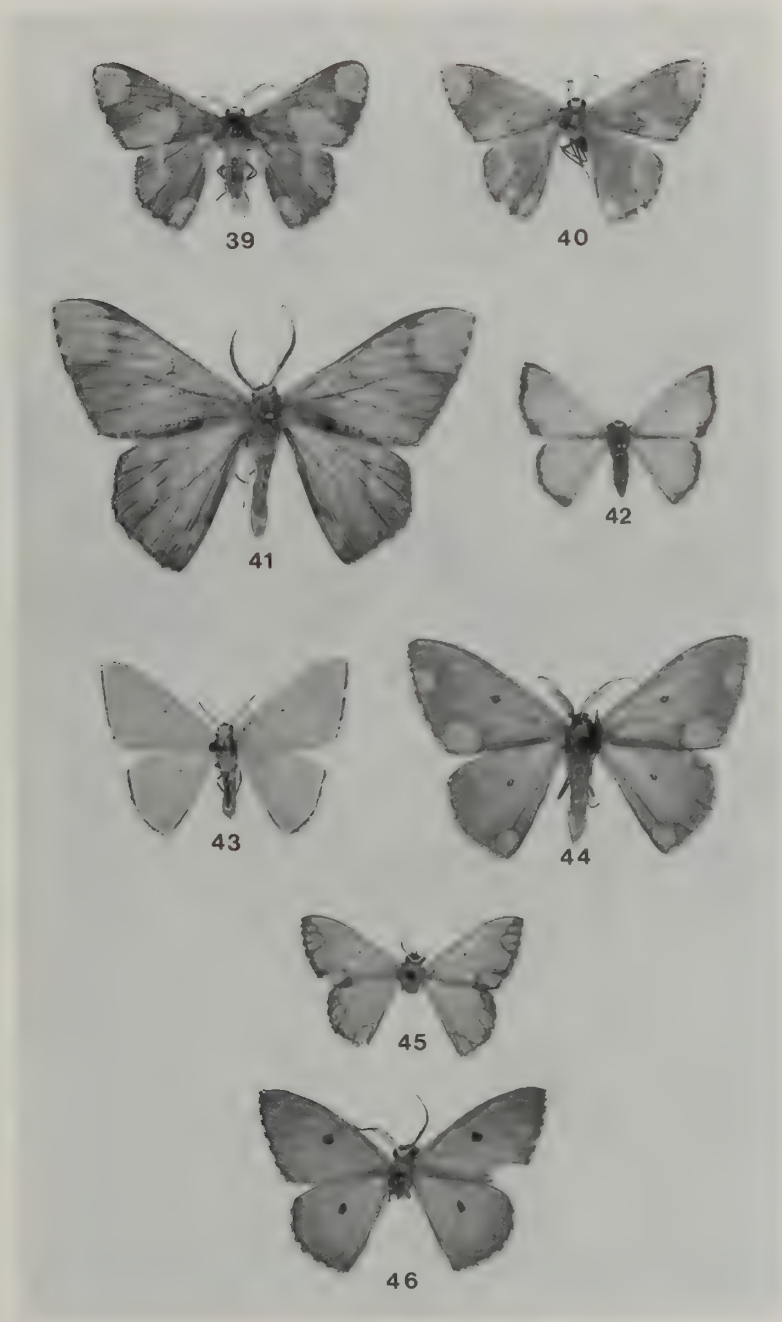


**Figs 23–30** *Oospila* species. 23, *O. leucostigma*; 24, *O. delacruz*i; 25, *O. albipunctulata*; 26, *O. rufilimes*; 27, *O. arpata*; 28, *O. fimbripedata*; 29, *O. zamaradaria*; 30, *O. miccularia*.



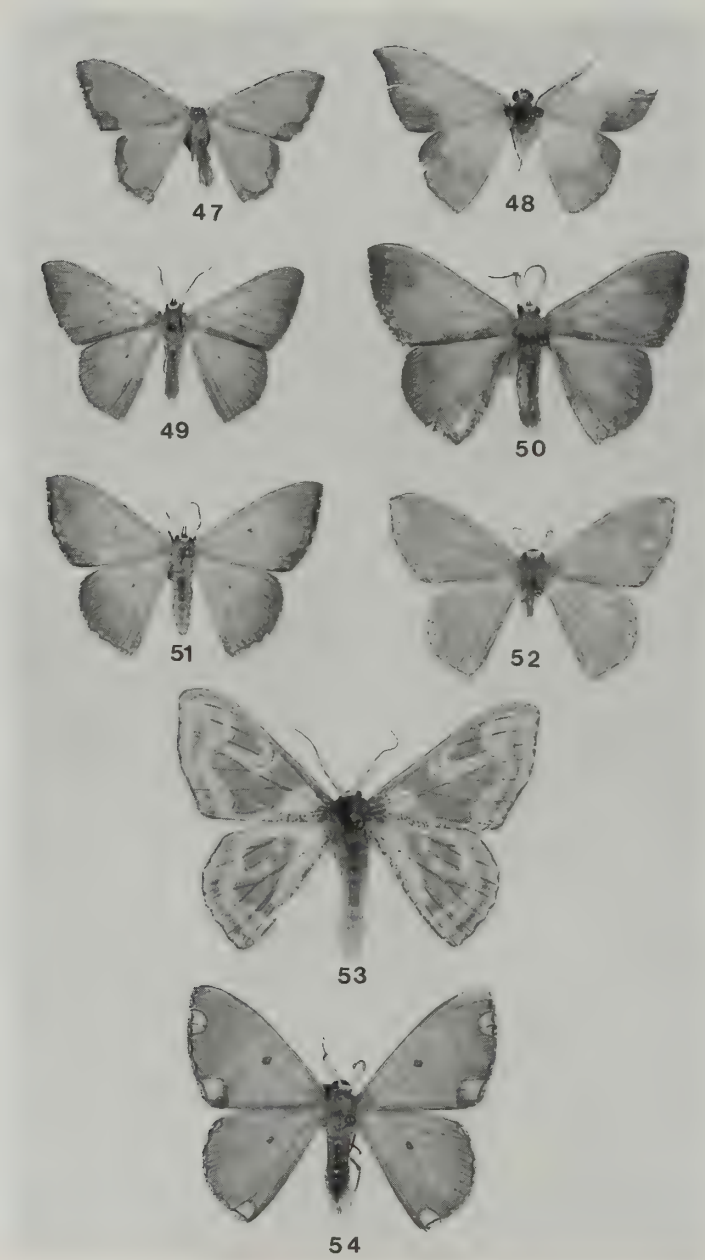


**Figs 31–38** *Oospila* species. 31, *O. euchlora*; 32, *O. ecuadorata*; 33, *O. athena*; 34, *O. holochroa*; 35, *O. lactecincta*; 36, *O. sporadata*; 37, *O. includaria*; 38, *O. leucothalera*.

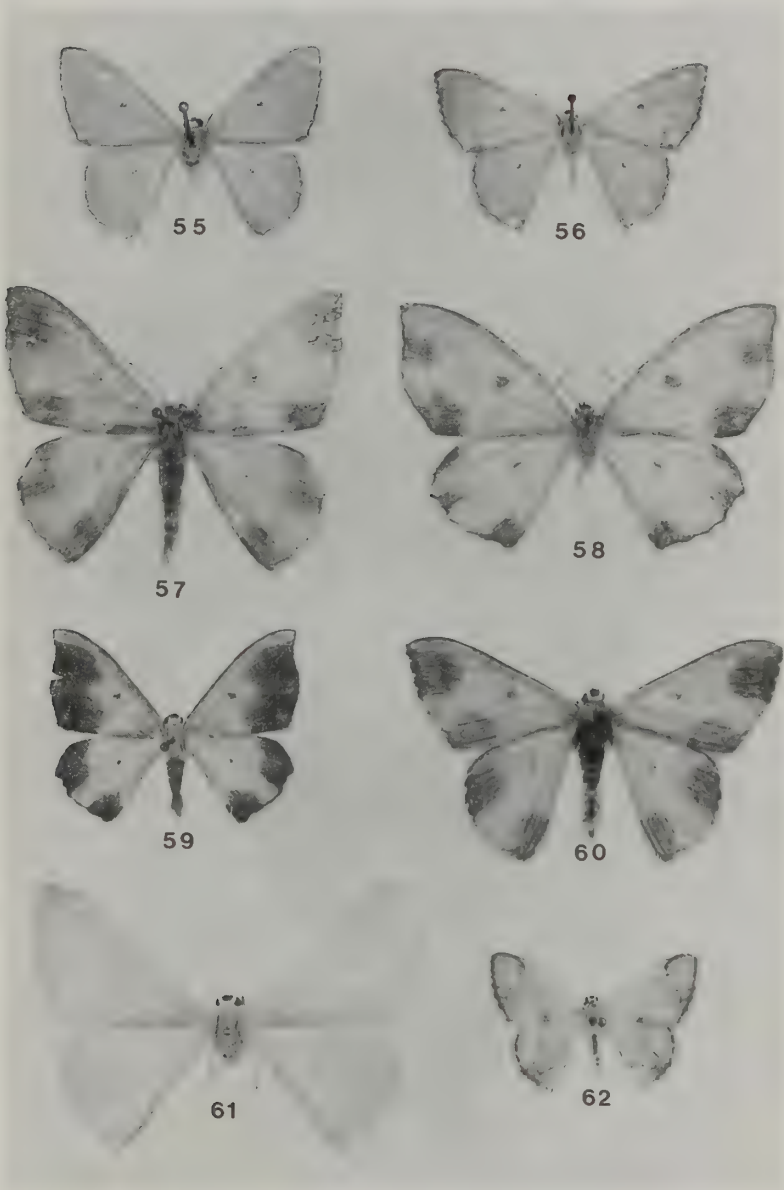


**Figs 39–46** *Oospila* species. 39, *O. albicoma albicoma*; 40, *O. albicoma nasuta*; 41, *O. concinna*; 42, *O. dicraspeda*; 43, *O. ciliaria*; 44, *O. trilunaria*; 45, *O. carnelunata*; 46, *O. altonaria*.



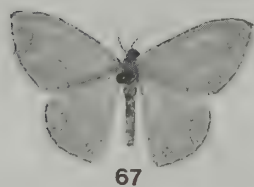


**Figs 47–54** *Oospila* species. 47, *O. confluaria*; 48, *O. longipalpis*; 49, *O. sellifera*; 50, *O. lilacina*; 51, *O. violacea*; 52, *O. callicula*; 53, *O. obeliscata*; 54, *O. marginata*.

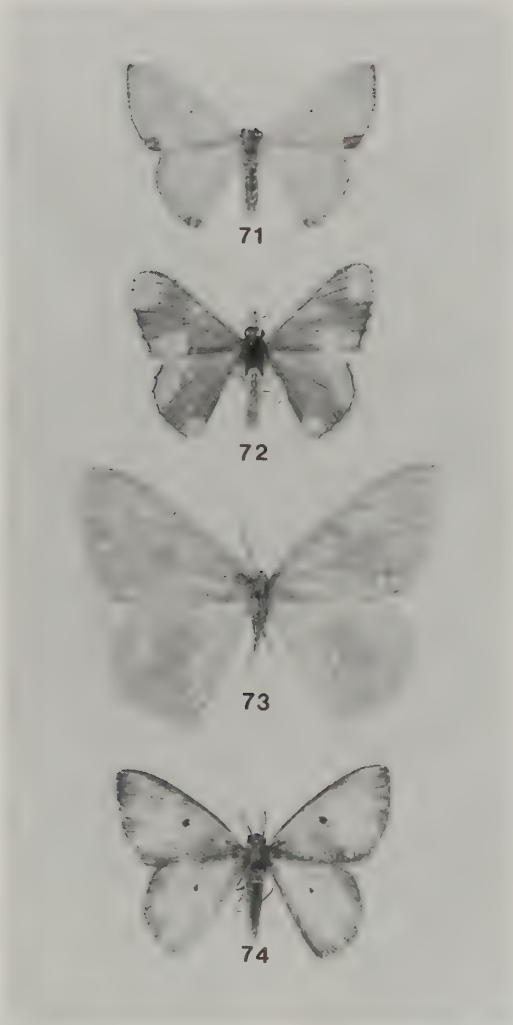


**Figs 55–62** *Oospila* species. 55, *O. tricamerata*; 56, *O. obsolescens*; 57, *O. atopochlora*; 58, *O. hyalina*; 59, *O. atroviridis*; 60, *O. congener*; 61, *O. immaculata*; 62, *O. rubescens*.



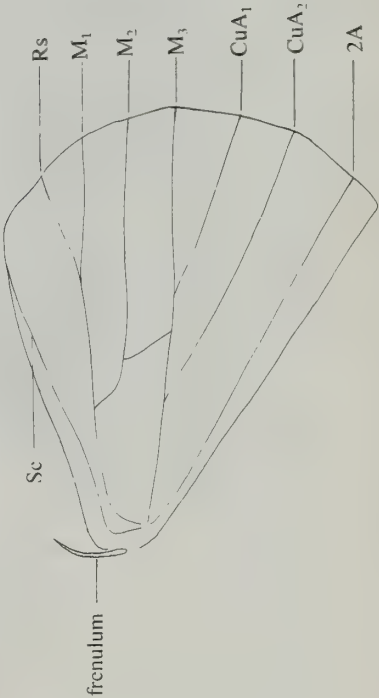
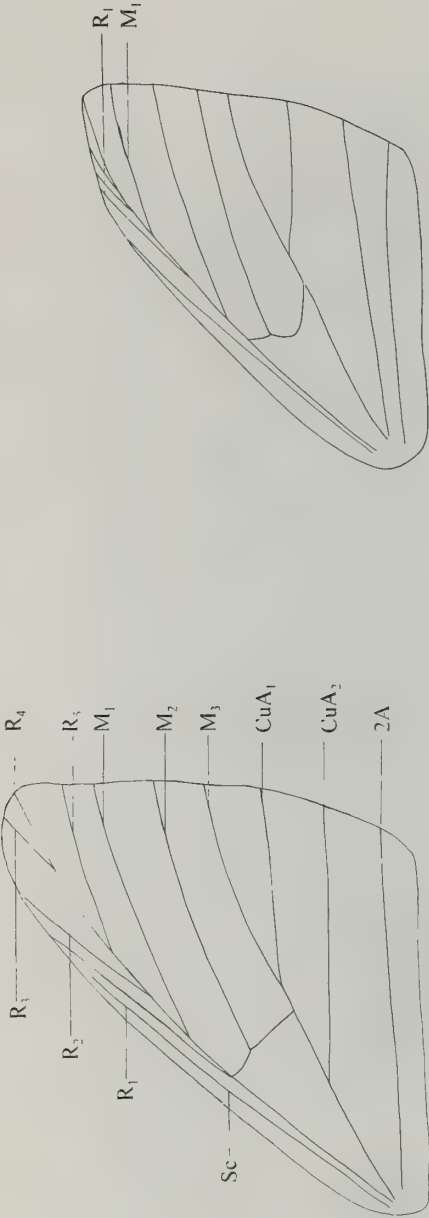


**Figs 63–70** *Oospila* species. 63, *O. circumsignata*; 64, *O. decoloraria*; 65, *O. jaspidata*; 66, *O. longiplaga*; 67, *O. lunicincta*; 68, *O. pellucida*; 69, *O. ruptimacula*; 70, *O. venezuelata*.

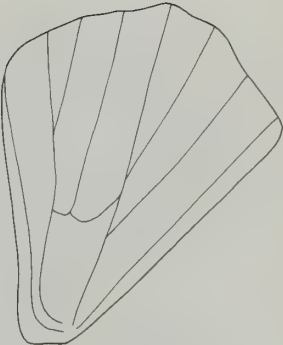
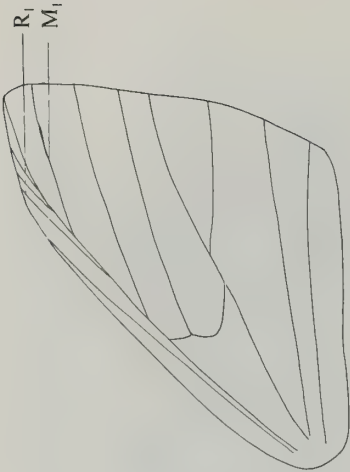


**Figs 71–74** *Oospila* species. 71, *O. confundaria*; 72, *O. depressa*; 73, *O. stagonata*; 74, *O. nivetacta*.



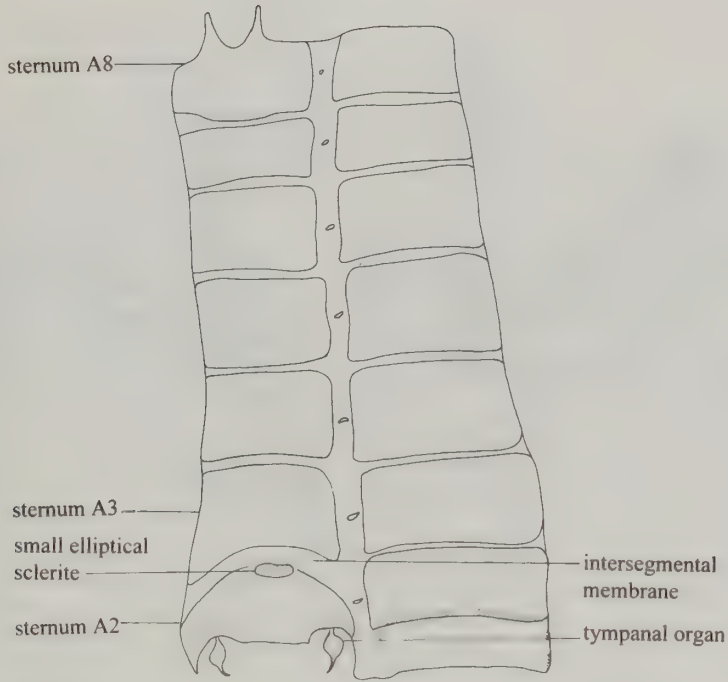


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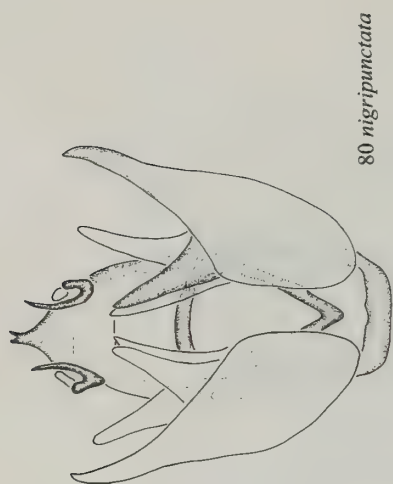
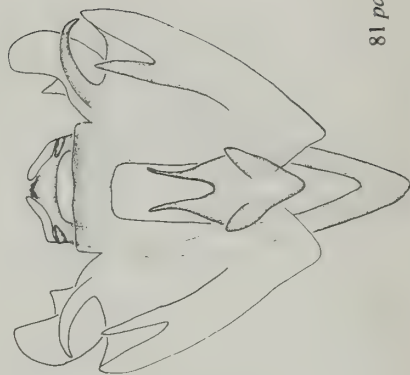
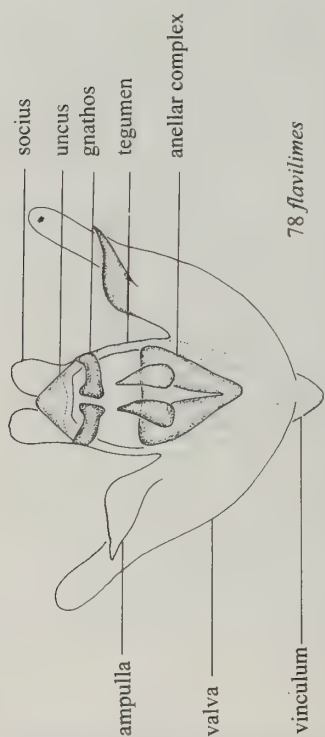
Figs 75–76 Wing venation of *Oospila* species. 75, *O. marginata* ♂; 76, *O. delacruzi* ♀.



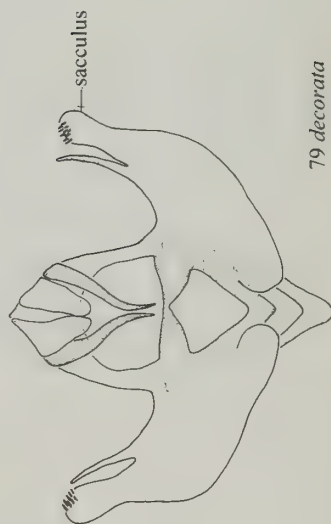
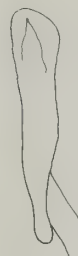
**Fig. 77** Pregenital abdomen of *O. carnelunata* ♂.

**Figs 78–199 on following pages.** 78–145, male genitalia and sternum A8 of *Oospila* species; 146–199, female genitalia of *Oospila* species.

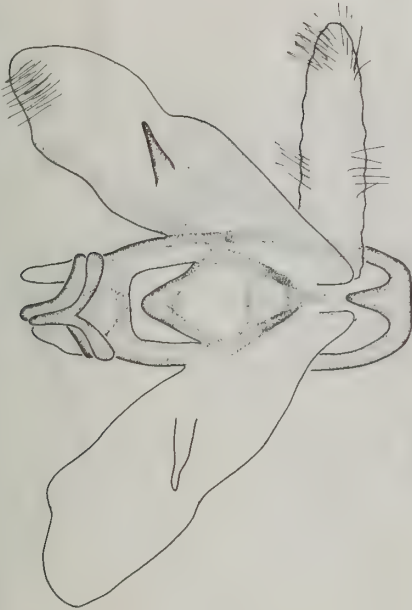


80 *nigripunctata*81 *pallidaria*78 *flavilimes*

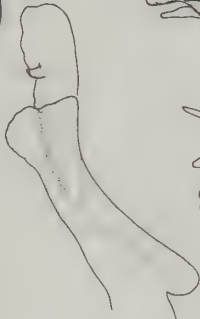
vesica cornutus — aedeagus

79 *decorata*

sacculus



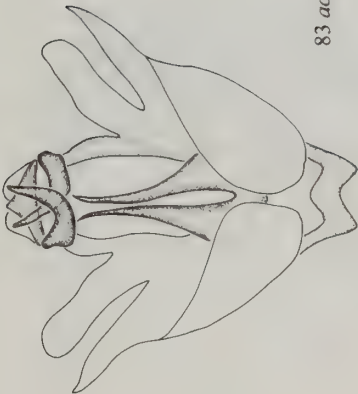
84 *quinquemaculata*



85 *continuata*



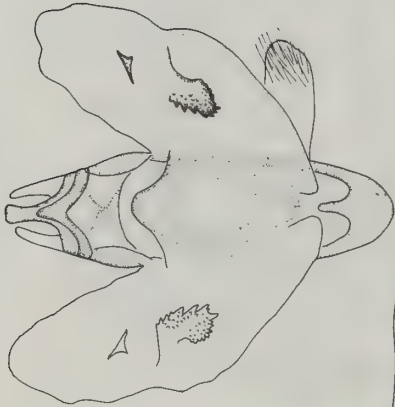
82 *subaurea*



83 *acymanta*



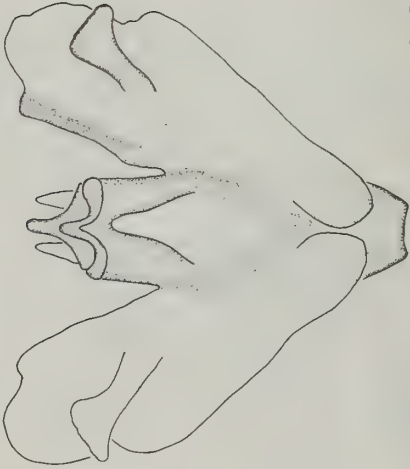
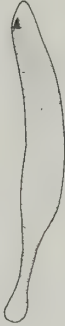




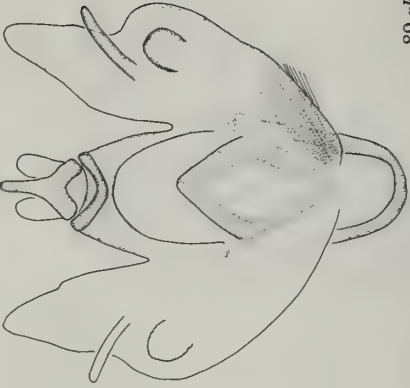
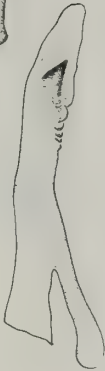
86 *excrescens*



88 *semispurcata*

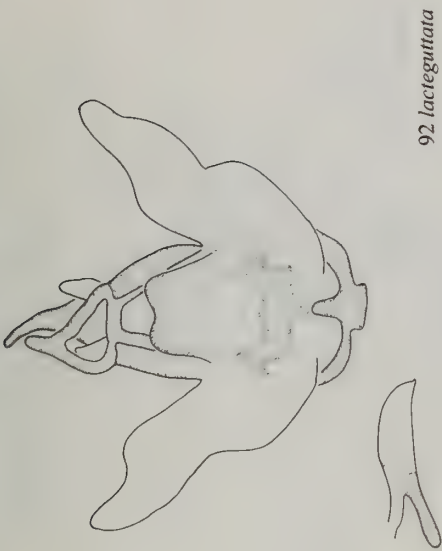


87 *florepicta*

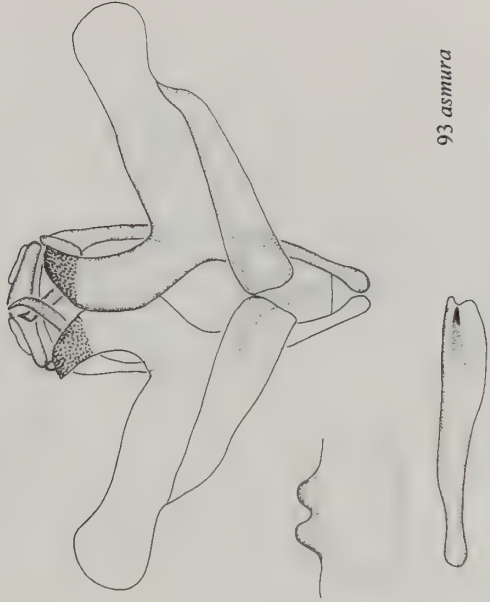


89 *rhodophragma*





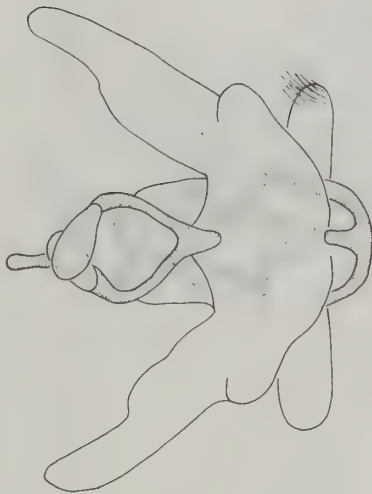
92 *lacteguttata*



93 *asmura*



90 *granulata*



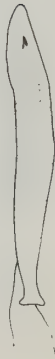
91 *thalassina*







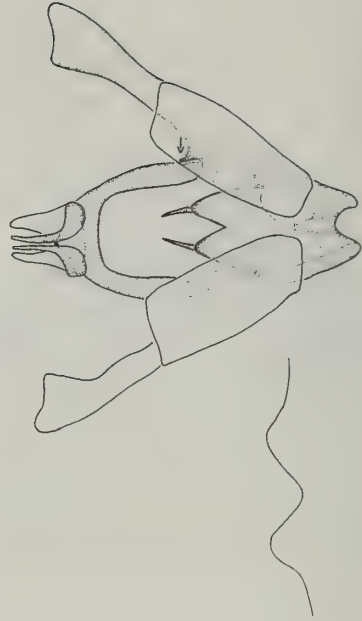
94 *circummessa*



96 *camilla*

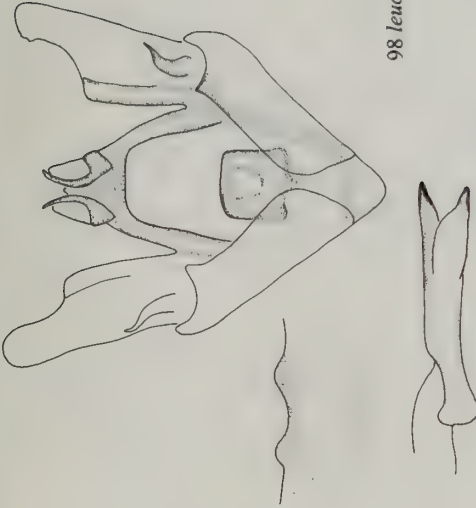


95 *rosipara & delphinata*

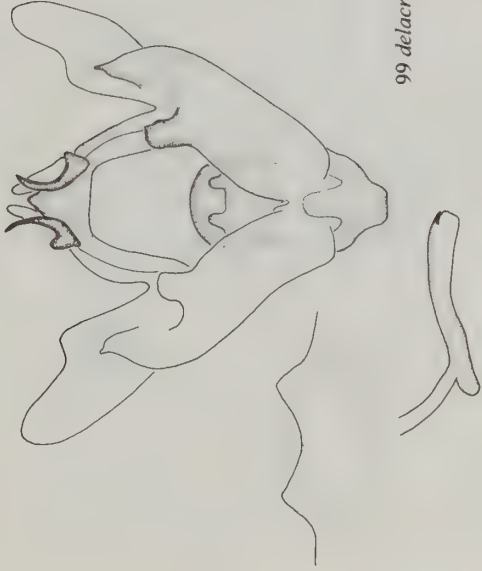


97 *astigma*

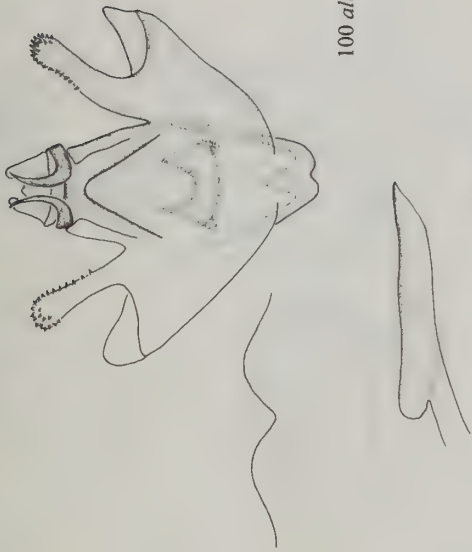




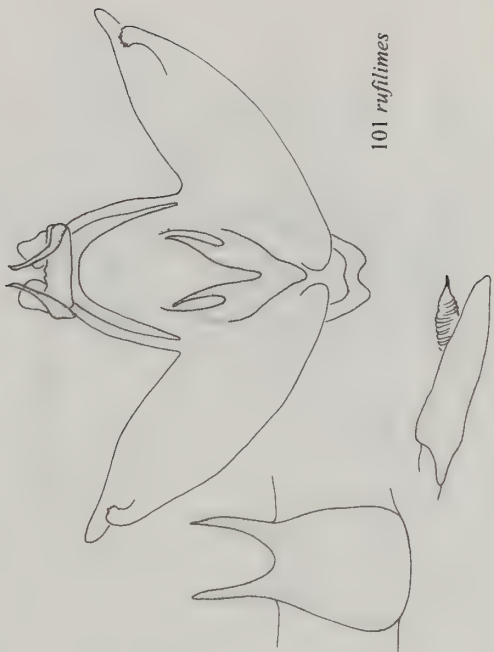
98 *leucostigma*



99 *delacruzii*

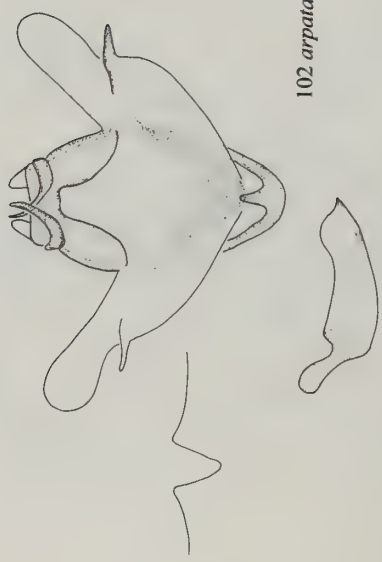


100 *albipunctulata*

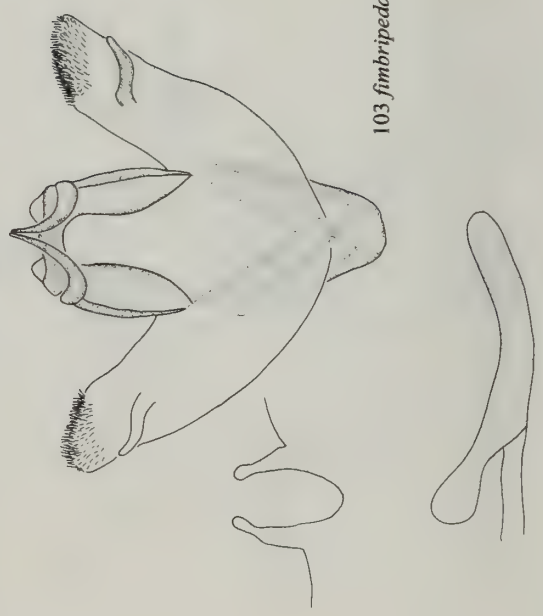


101 *rufilimes*

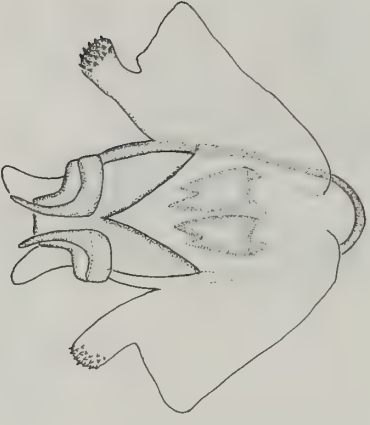




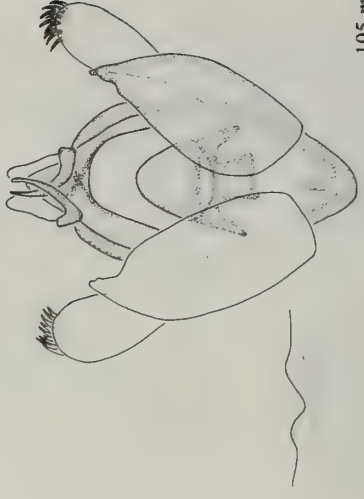
102 *arpata*



103 *fimbripedata*



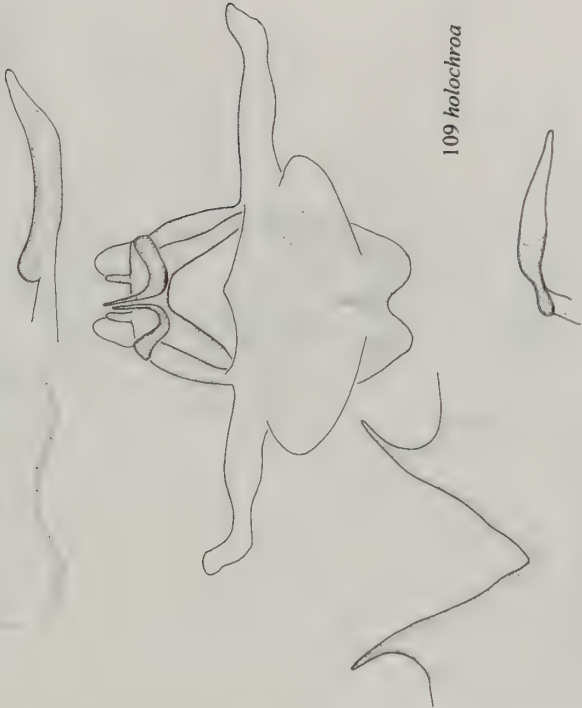
104 *zamradaria*



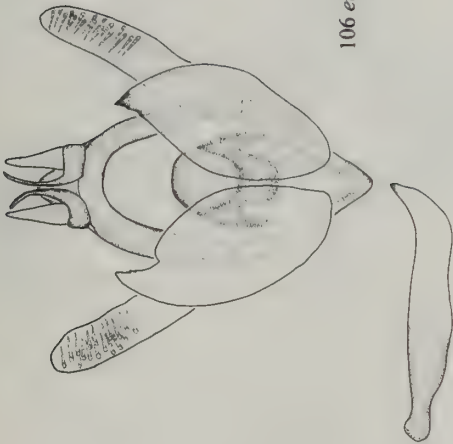
105 *miccularia*



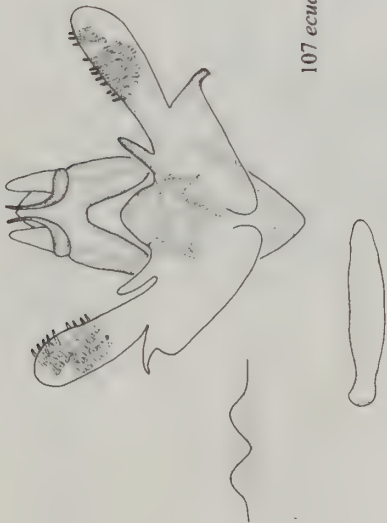
108 *athena*



109 *holochroa*

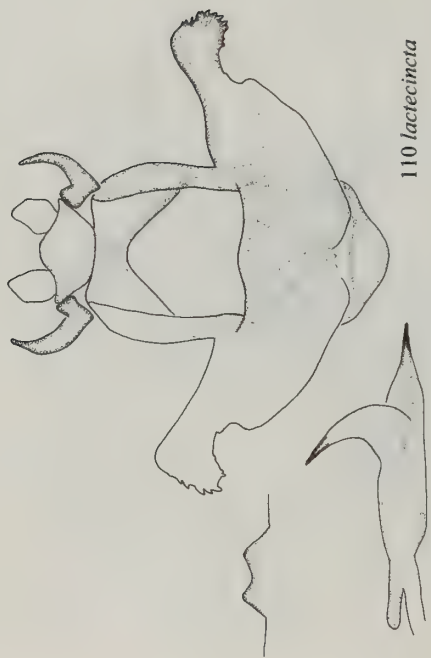


106 *euchlora*

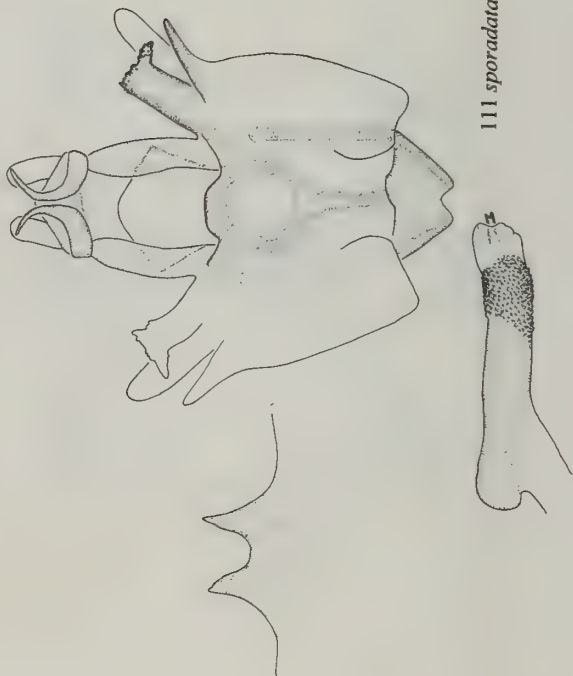


107 *eucadorata*

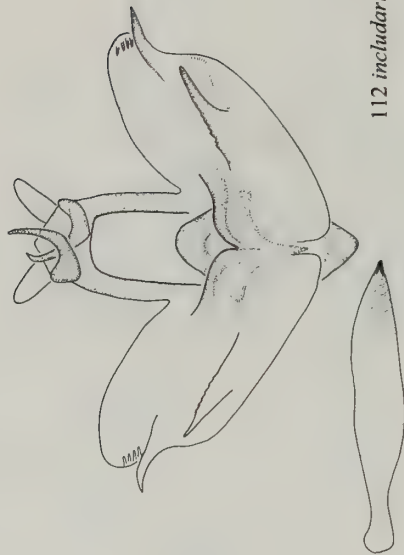




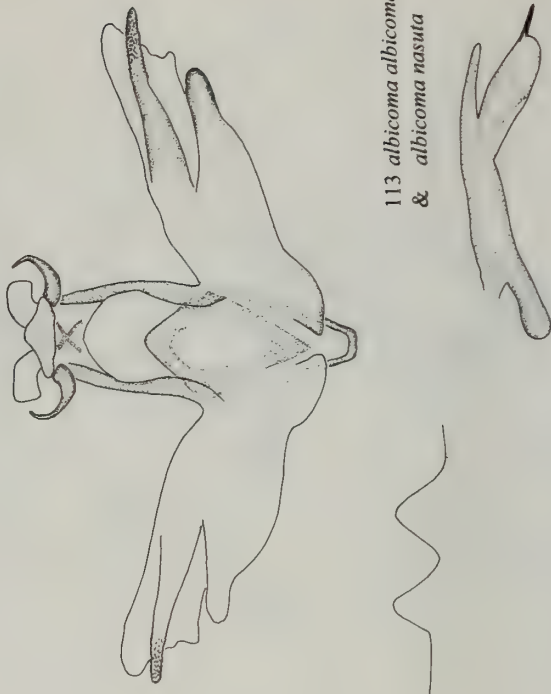
110 *lactecincta*



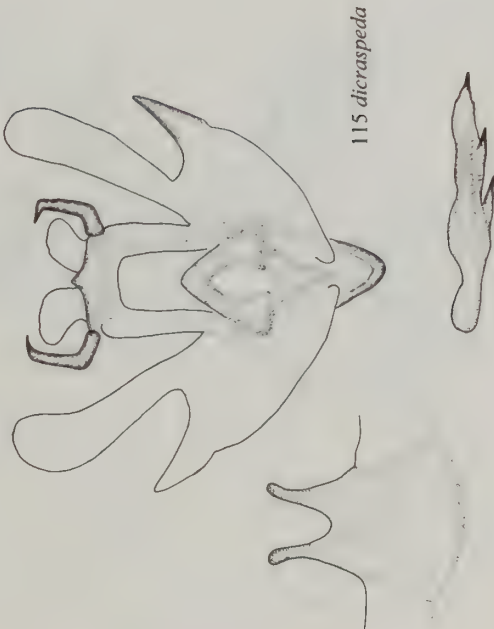
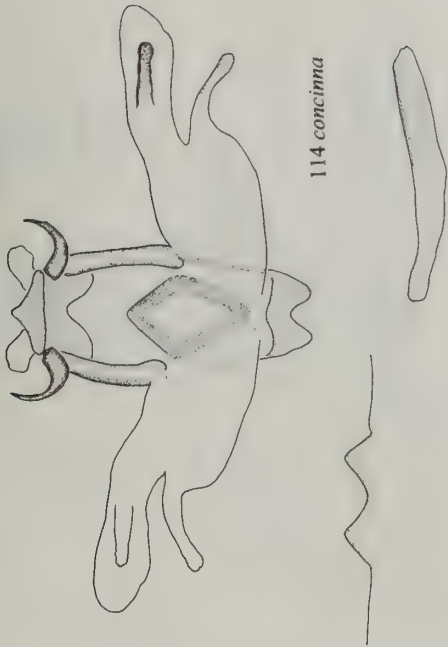
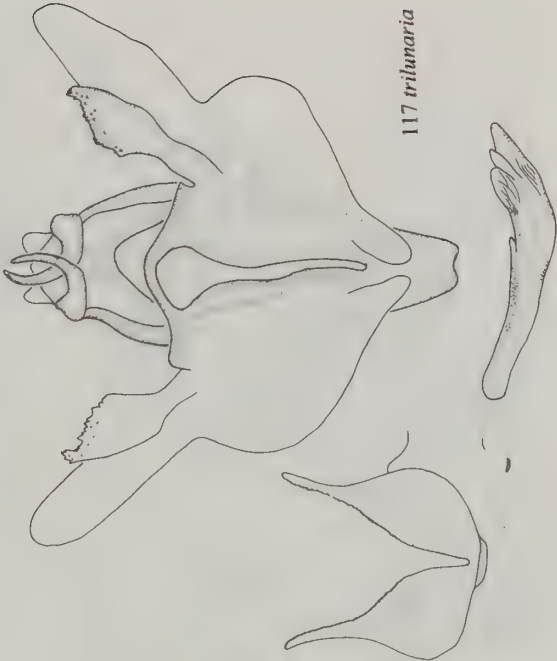
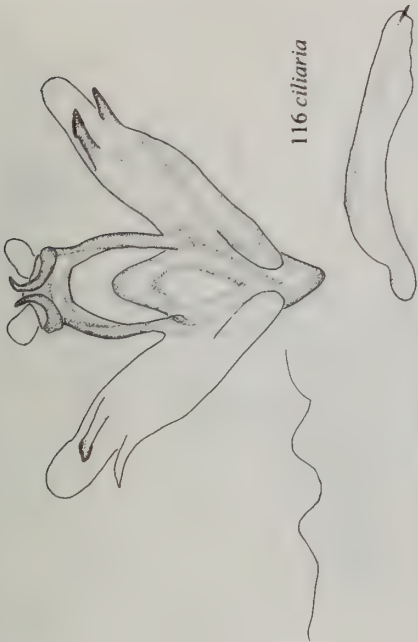
111 *sporadata*



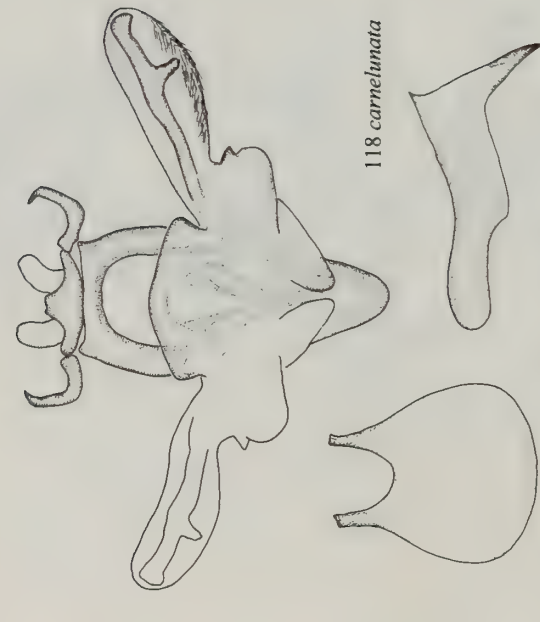
112 *includaria*



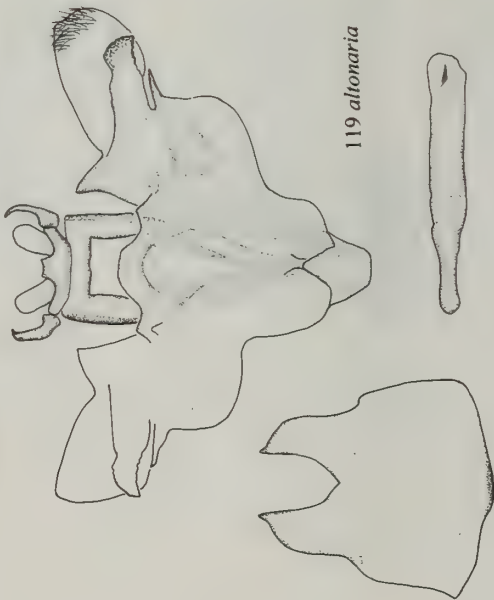
113 *albicoma albicoma*  
& *albicoma nasuta*



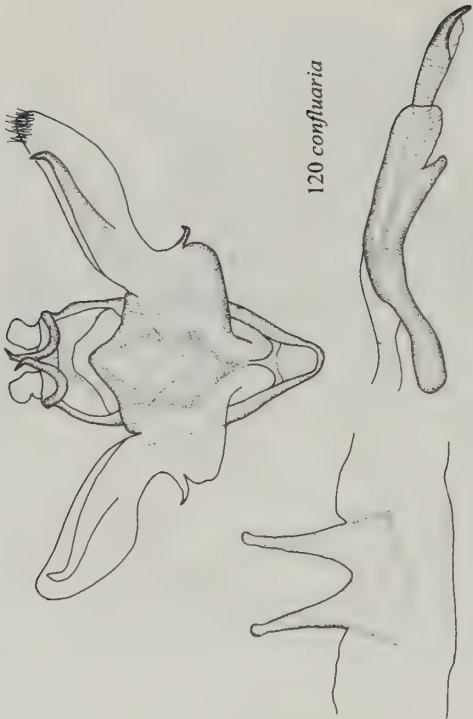




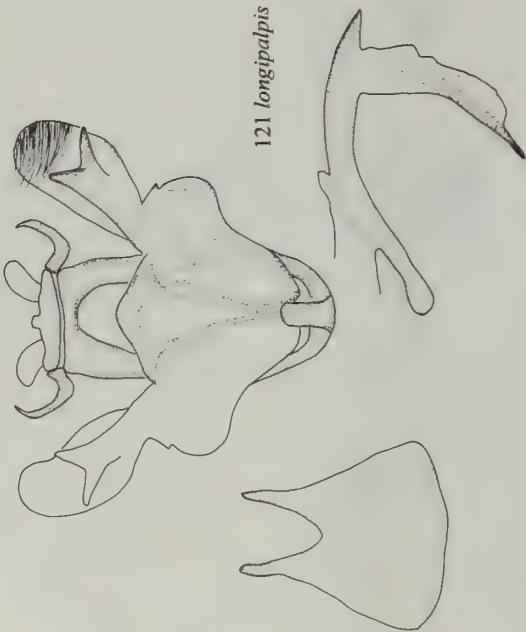
118 *carnelunata*



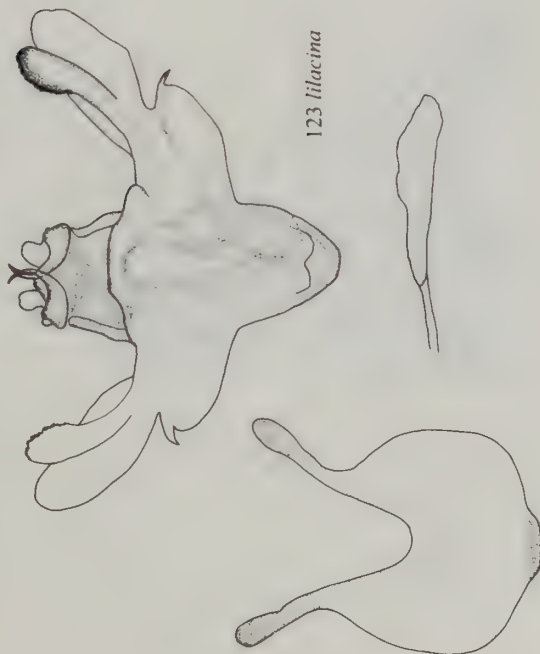
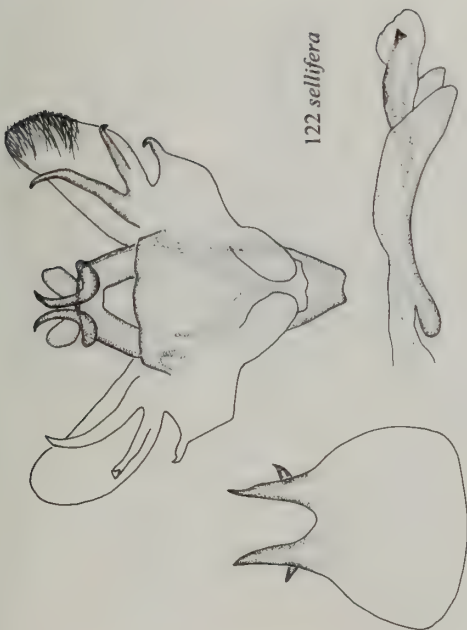
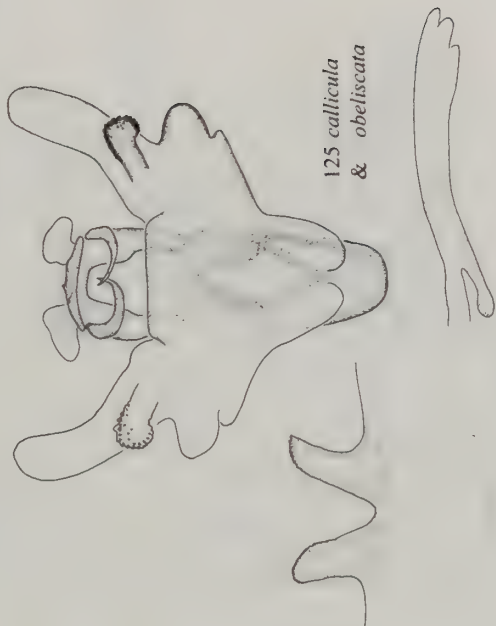
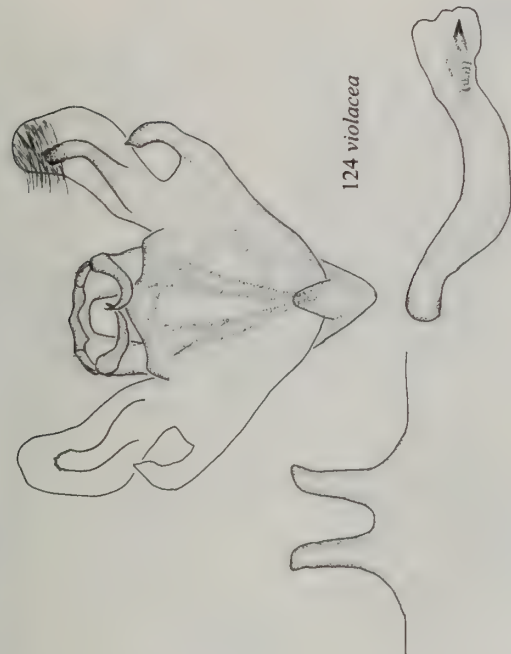
119 *altonaria*



120 *confluaria*



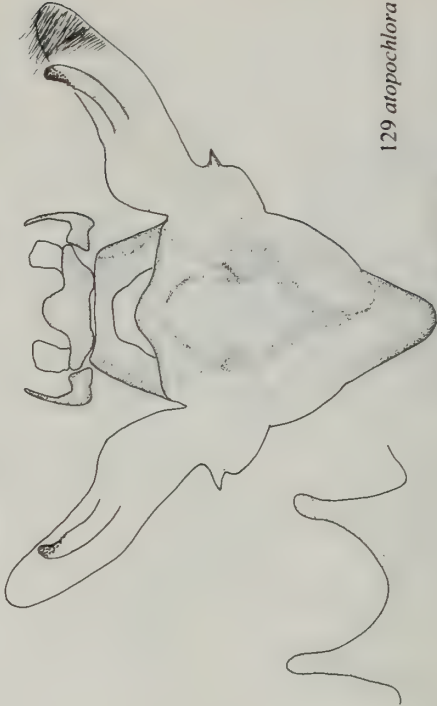
121 *longipalpis*



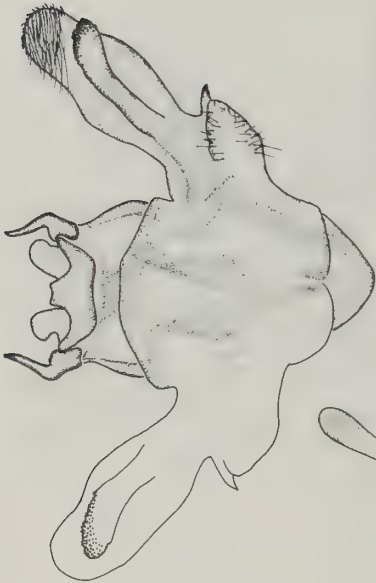




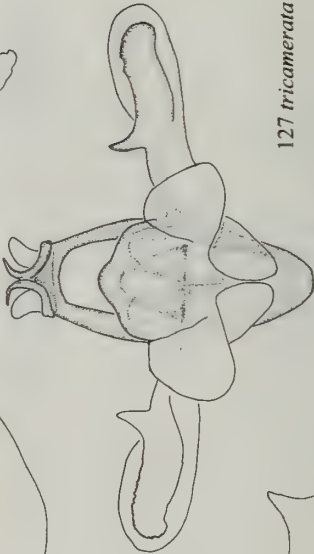
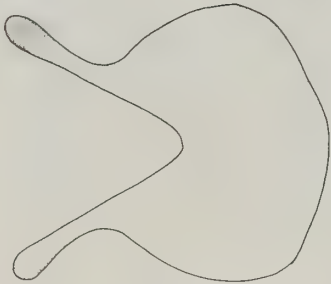
128 *obsolescens*



129 *atopochlora*

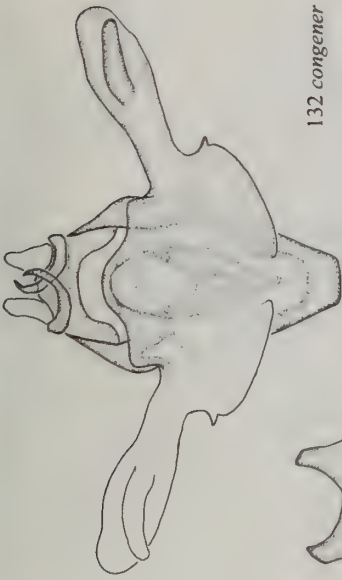


126 *marginata*

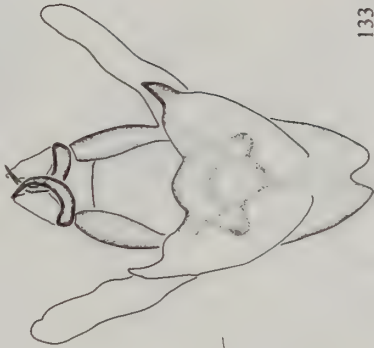


127 *tricamerata*

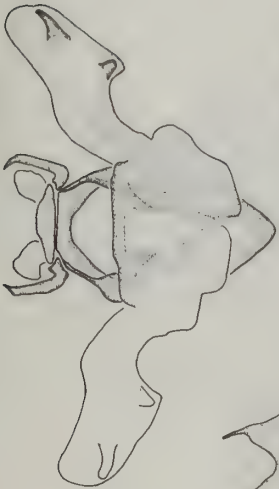
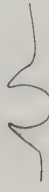




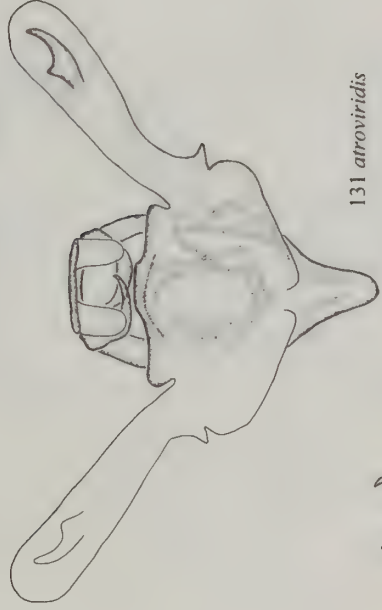
132 *congener*



133 *immaculata*



130 *hyalina*



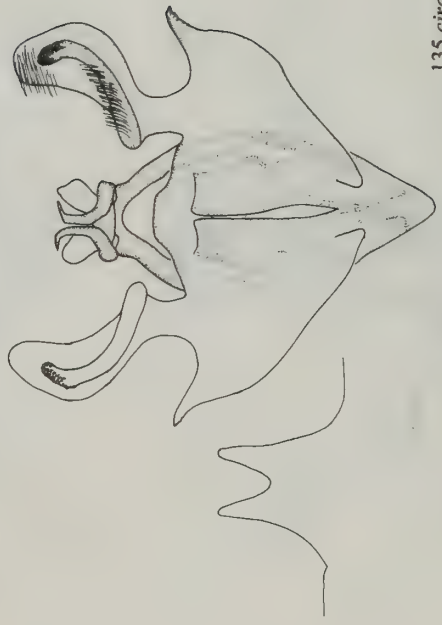
131 *atroviridis*







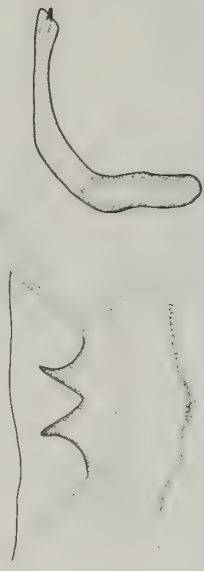
134 *rubescens*



135 *circumsignata*

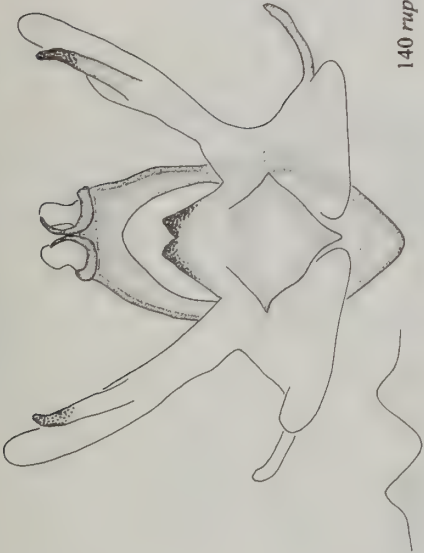


136 *decoloraria*

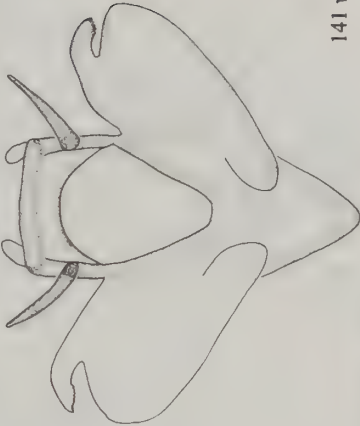
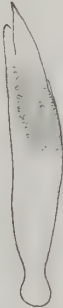


137 *longiplaga*

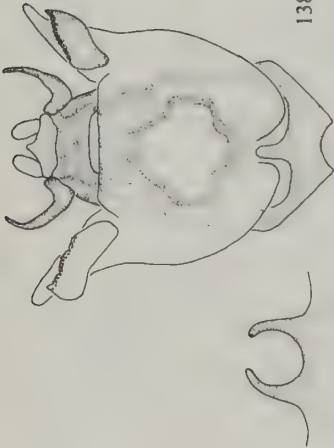




140 *rupimacula*



141 *venezuelata*

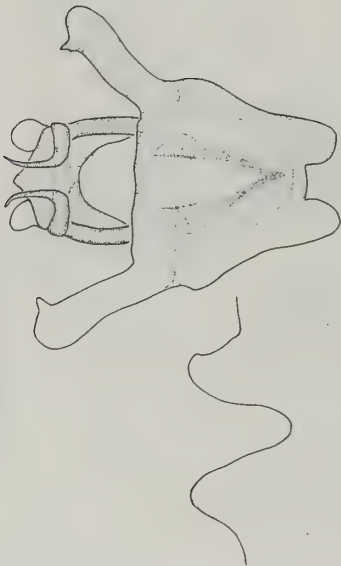


138 *lunicincta*

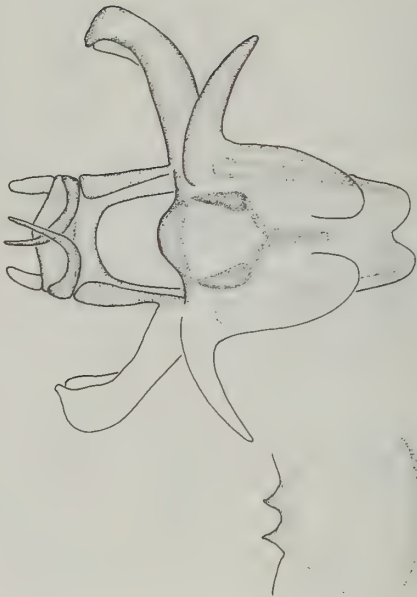


139 *pellucida*

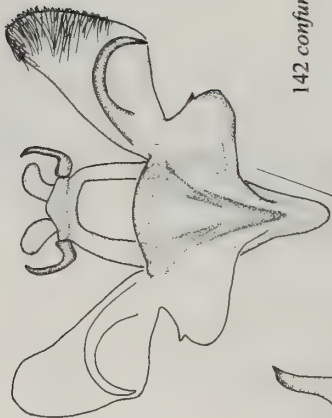




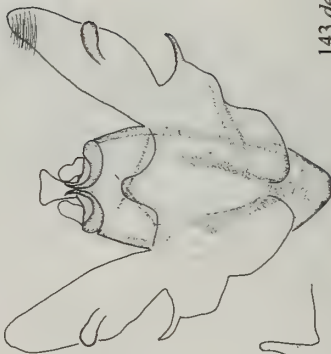
144 *stagonata*



145 *nivetacta*



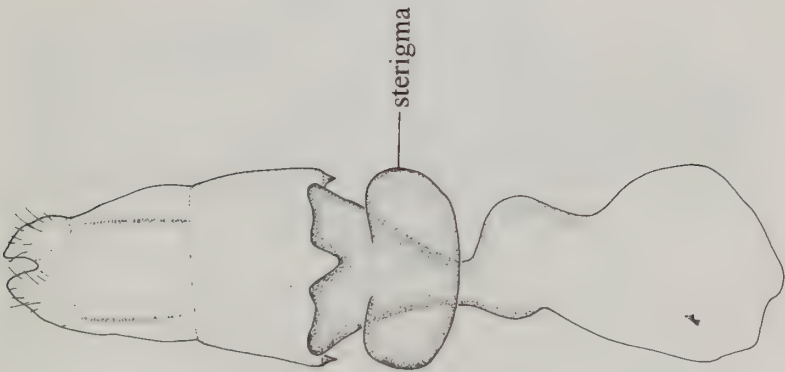
142 *confundaria*



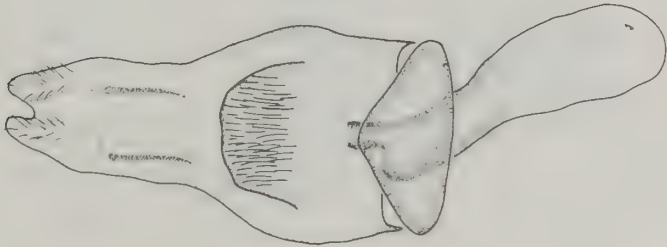
143 *depressa*



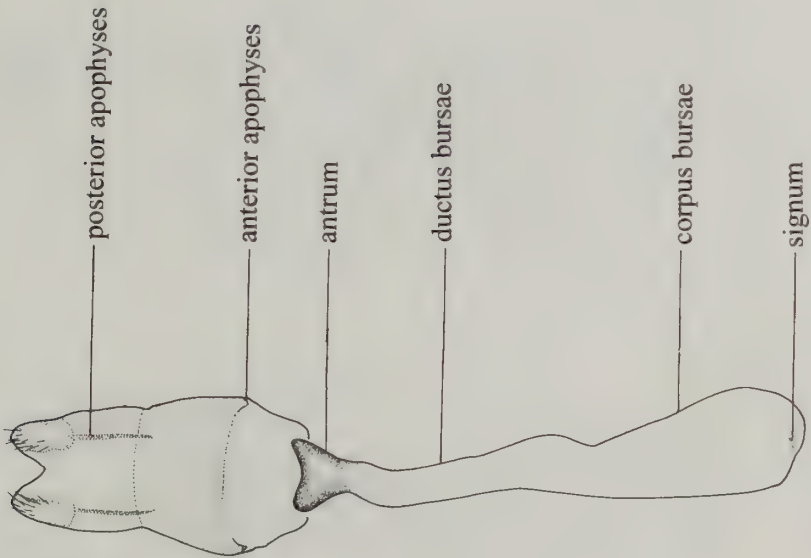




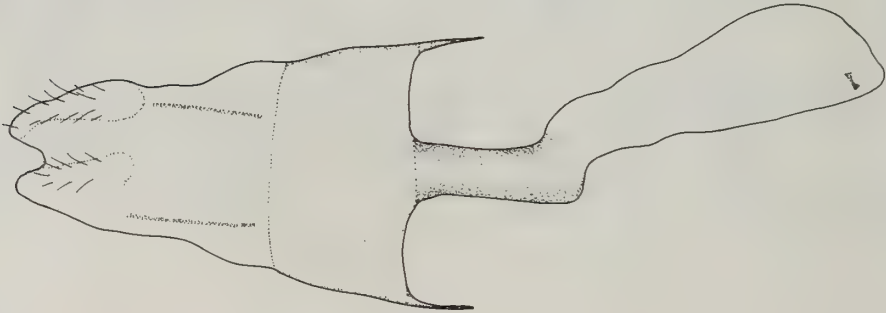
148 *nigripunctata*



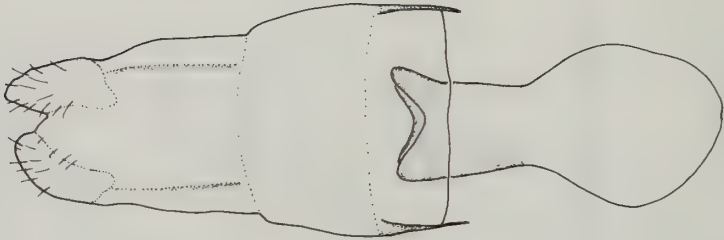
147 *decorata*



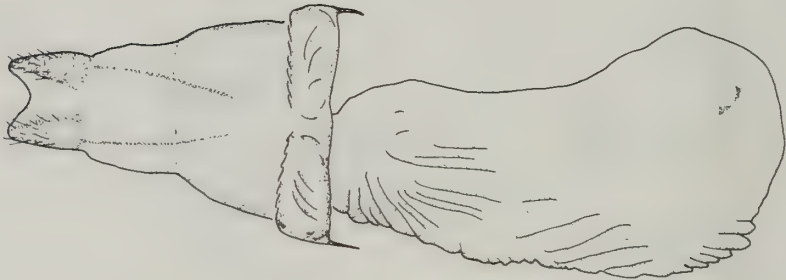
146 *flavilimes*



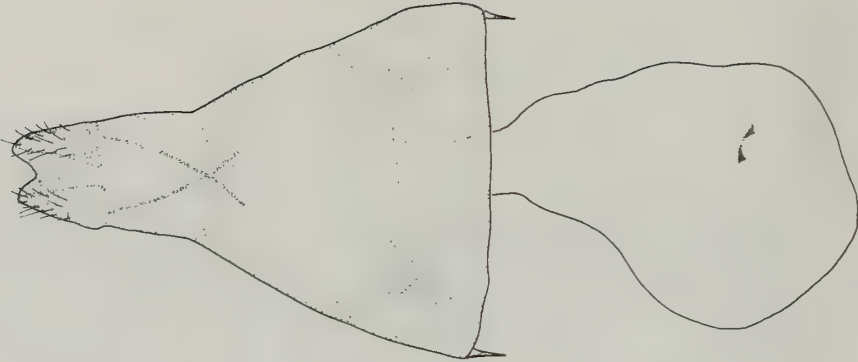
149 *permagna*



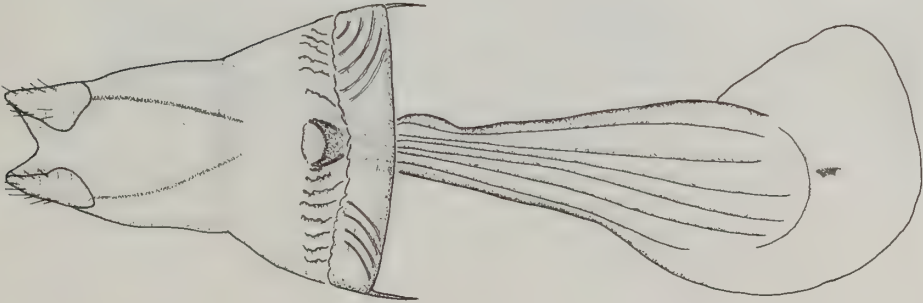
150 *pallidaria*



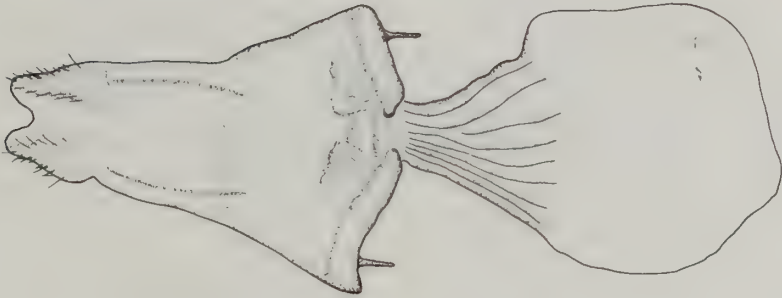
151 *quinquemaculata*



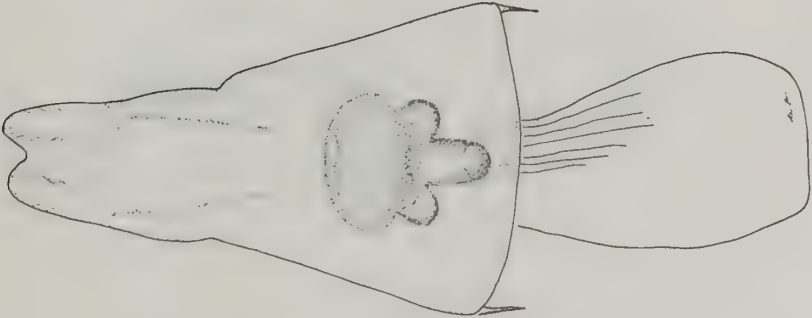
152 *continuata*



153 *excrescens*



154 *florepicta*

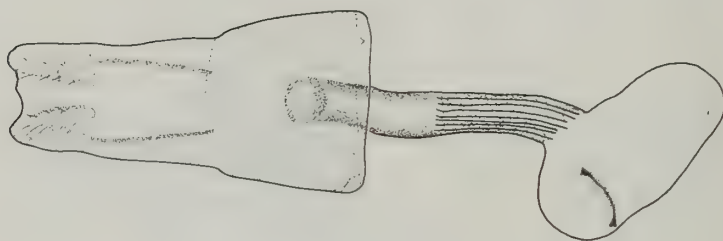
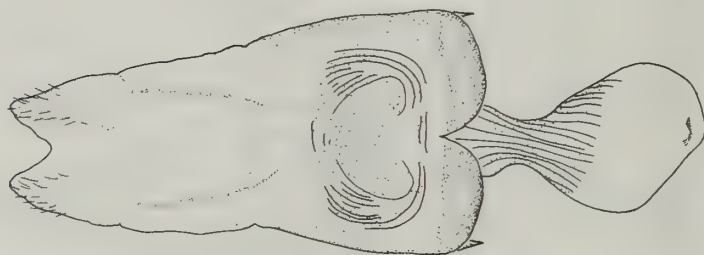


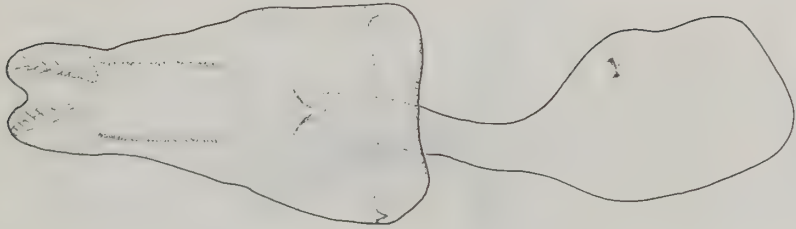
155 *semispurcata*



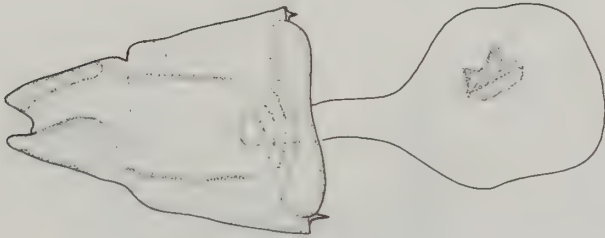
156 *asmura*



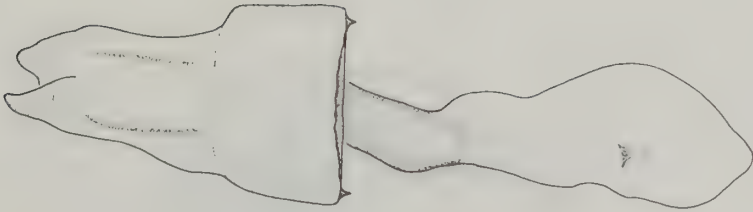
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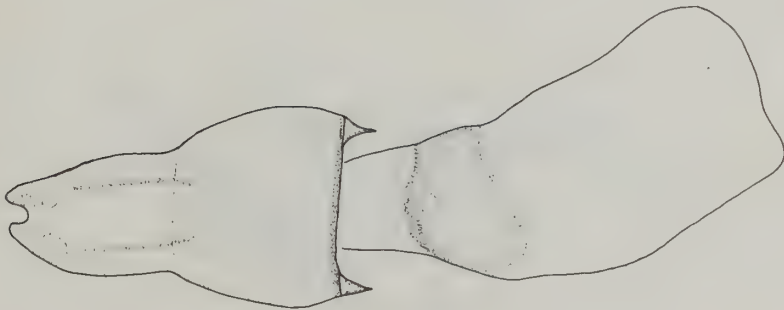
164 *athena*



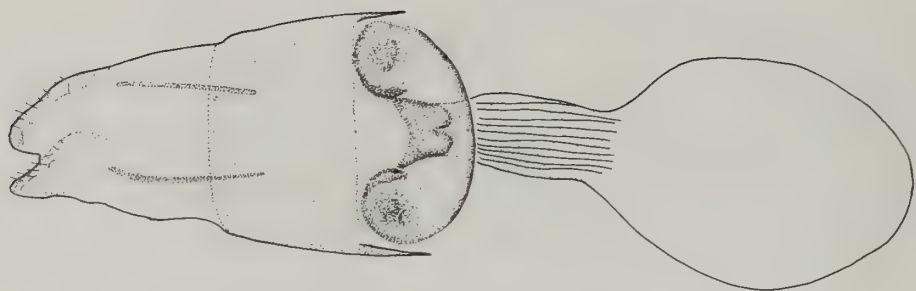
163 *miccularia*



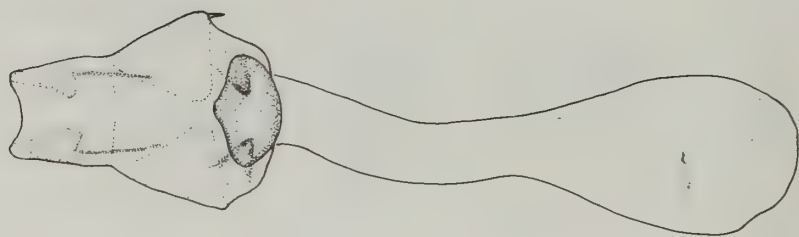
162 *arpata*



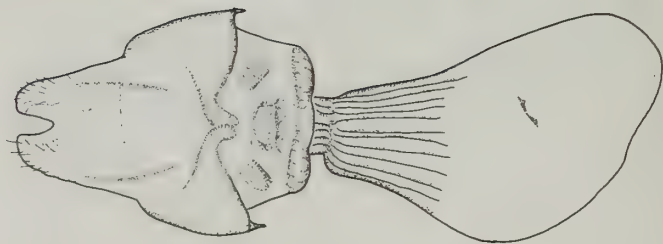
161 *rufilimes*



168 *leucothalera*



167 *includaria*

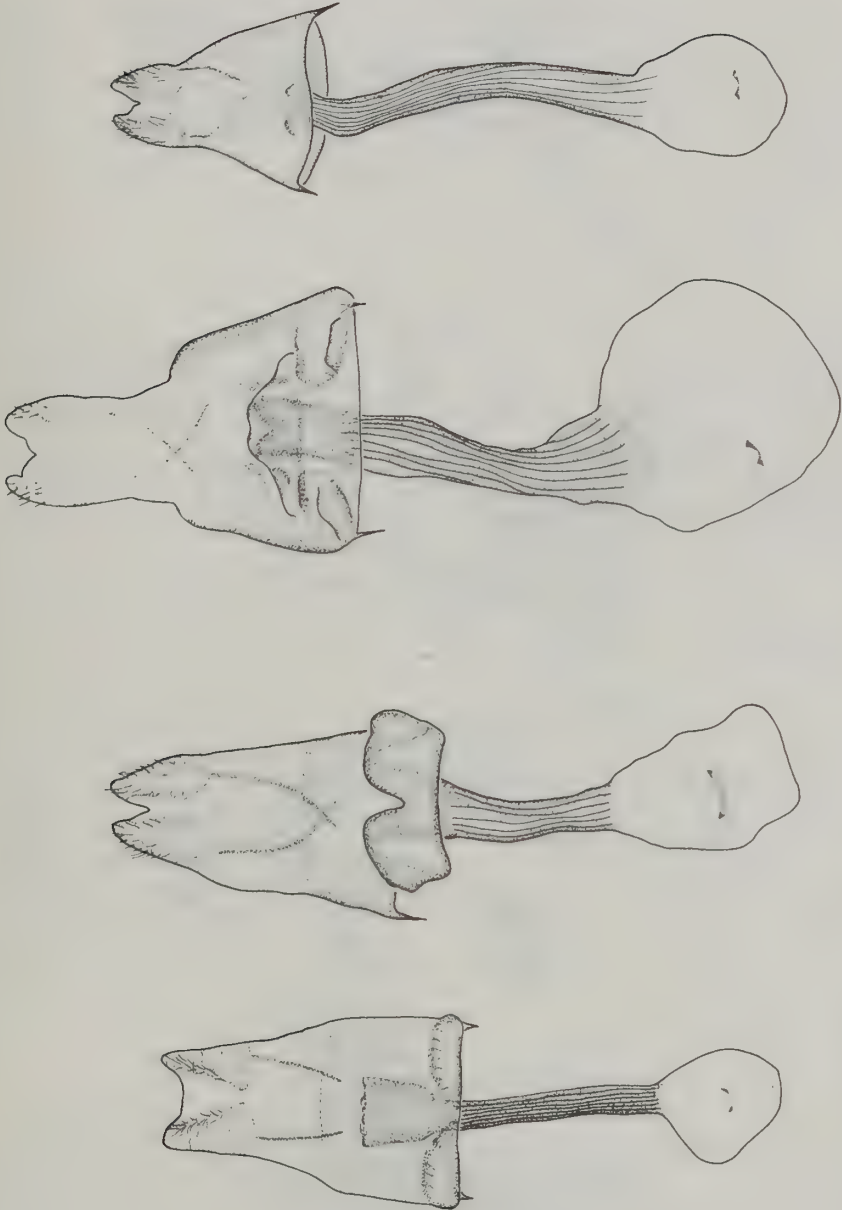


166 *sporadata*



165 *lactecincta*



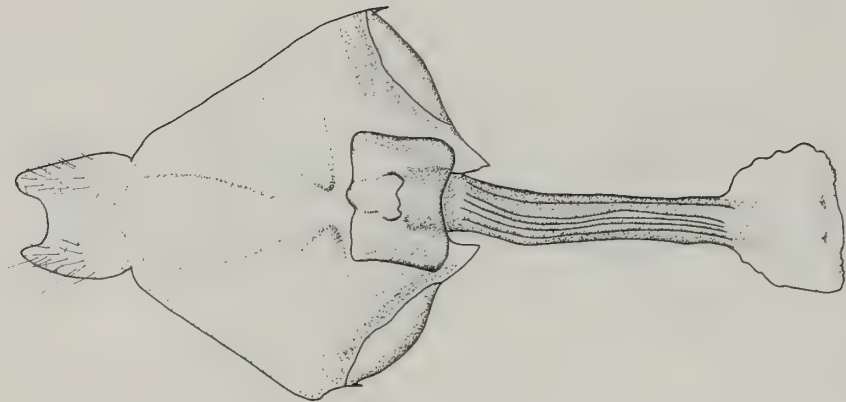


169 *albicoma albicoma*  
& *albicoma nasuta*

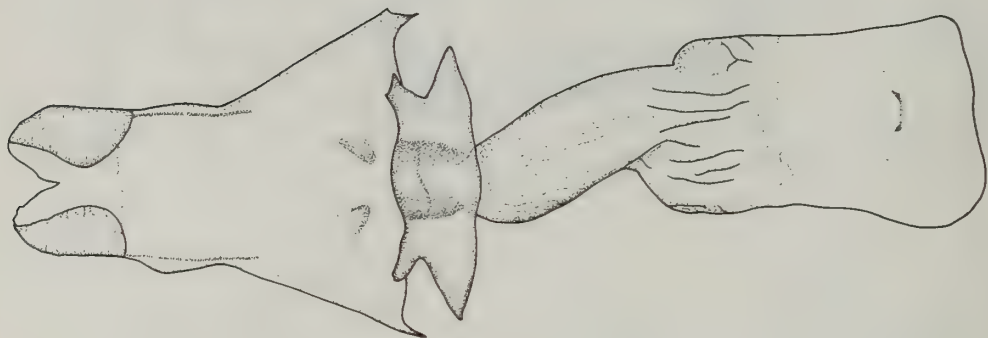
170 *concinna*

171 *dicraspeda*

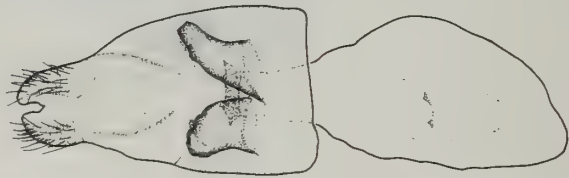
172 *ciliaria*



176 *longipalpis*



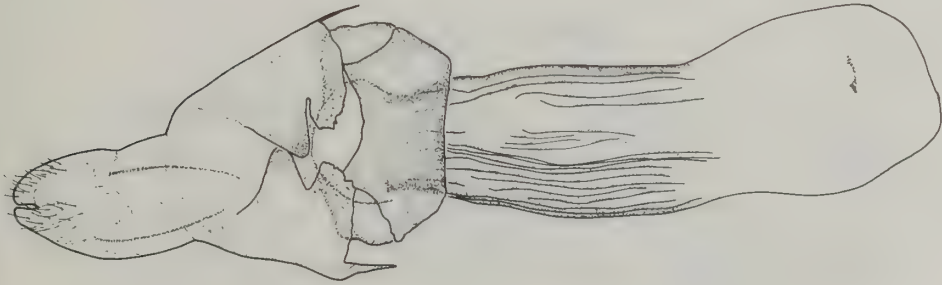
175 *confluaria*



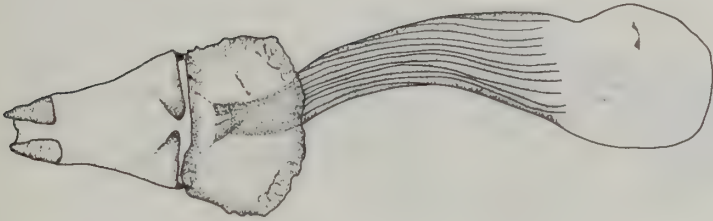
174 *carnelunata*



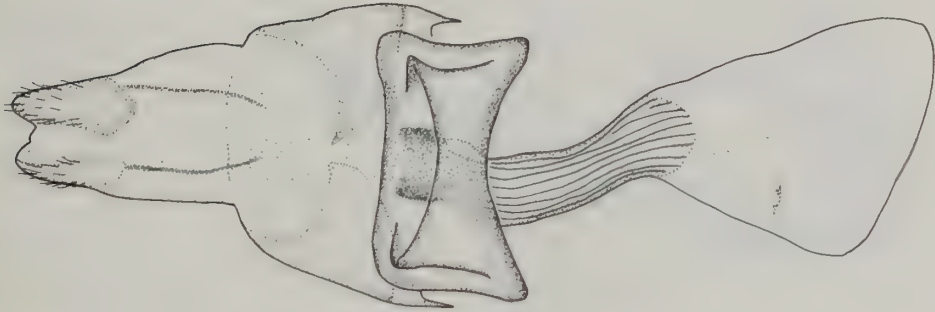
173 *trilunaria*



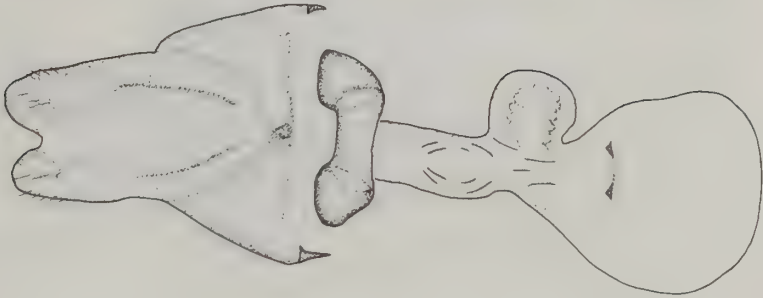
177 *sellifera*



178 *lilacina*

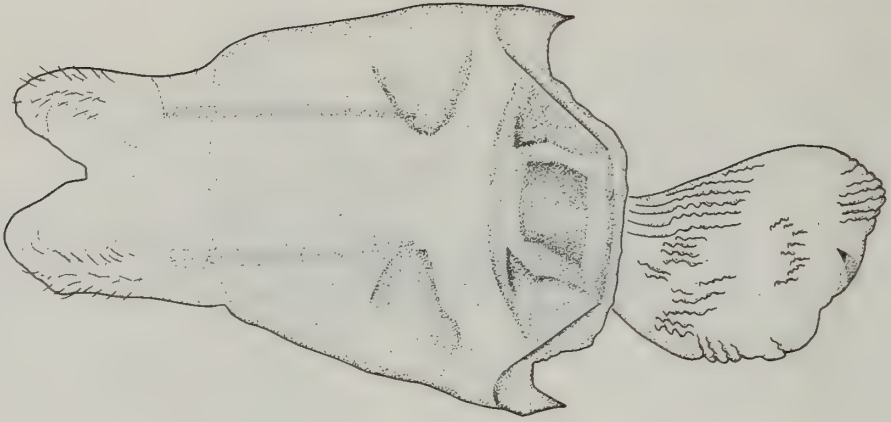


179 *violacea*



180 *callicula & obeliscata*





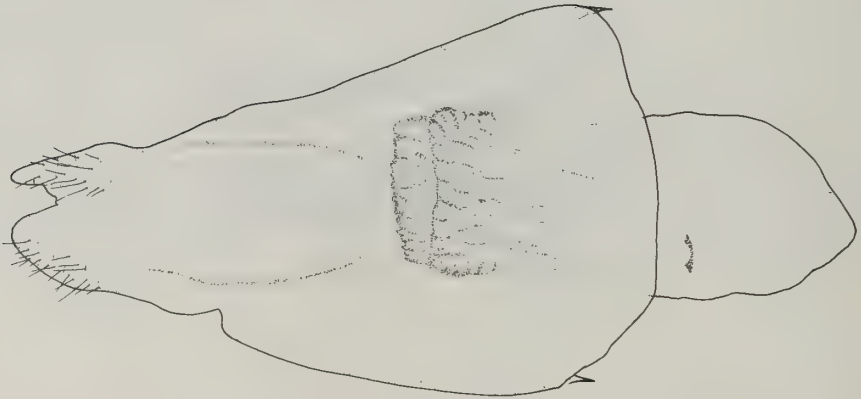
184 *atopochlora*



183 *obsolescens*



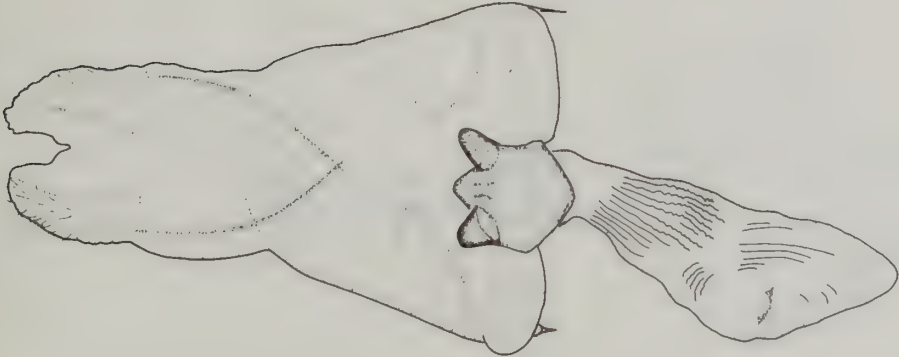
182 *tricamerata*



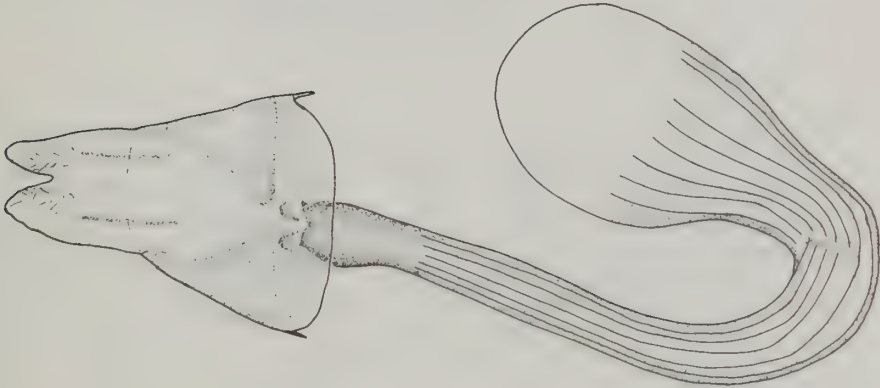
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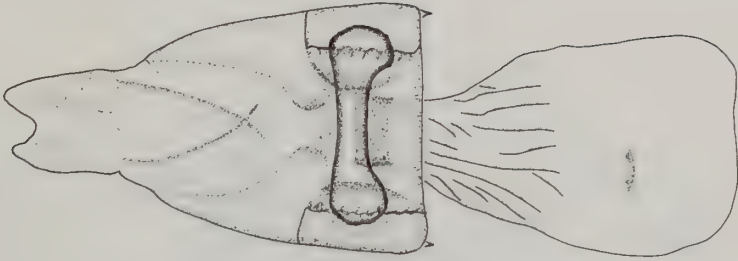
185 *hyalina*



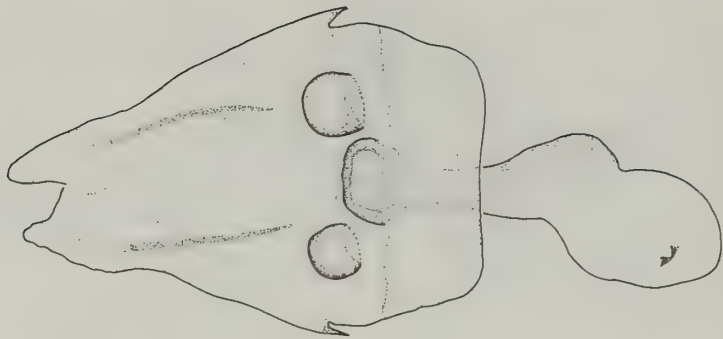
186 *congener*



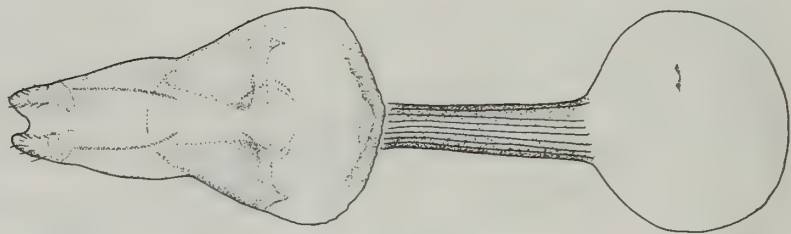
187 *immaculata*



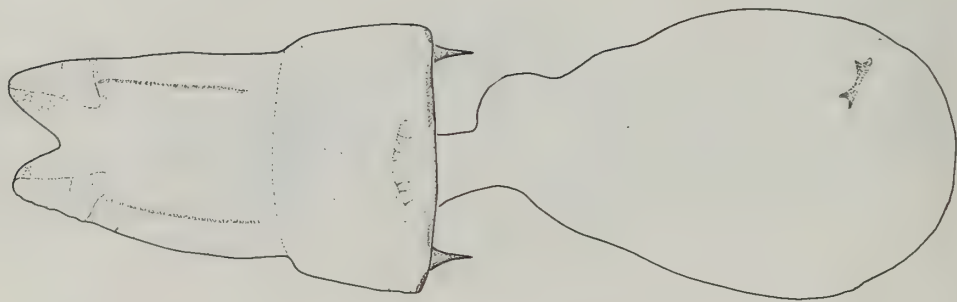
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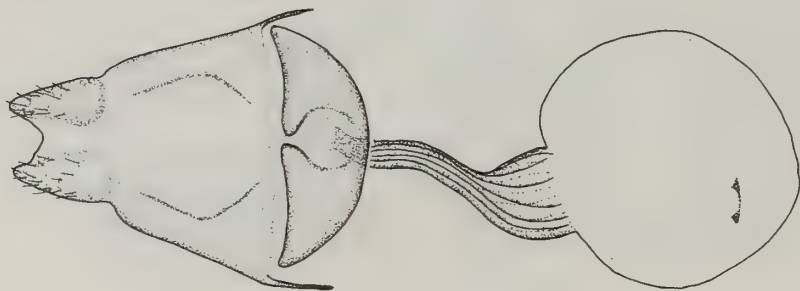
192 *lunicincta*



191 *longiplaga*



190 *jaspidata*

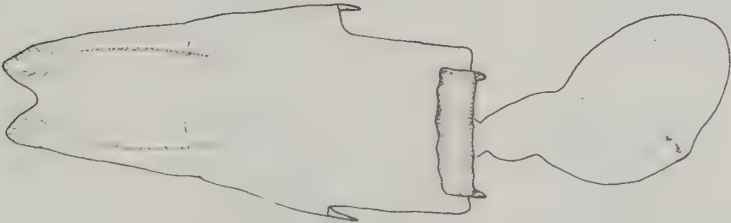


189 *decoloraria*





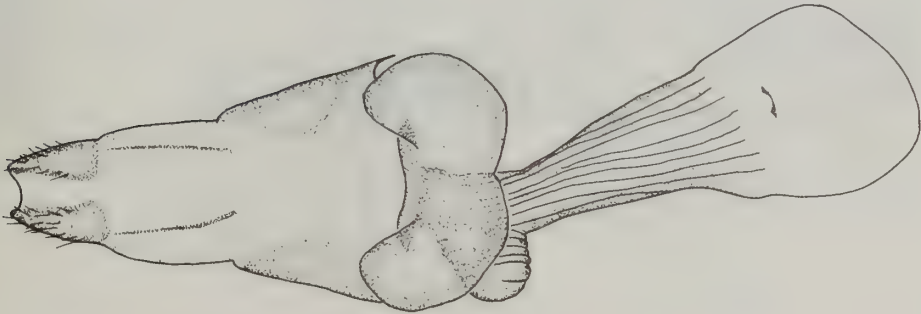
196 *confundaria*



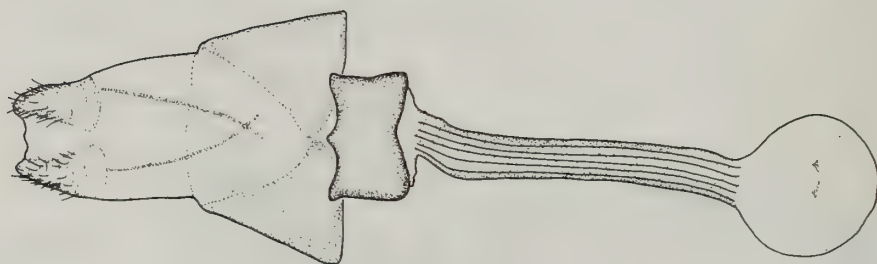
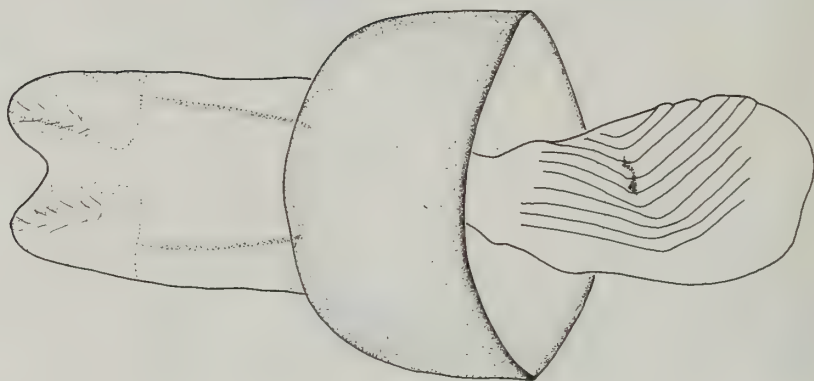
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Bulletin of The Natural History Museum

**ENTOMOLOGY SERIES**

Vol. 64, No. 1, June 1995